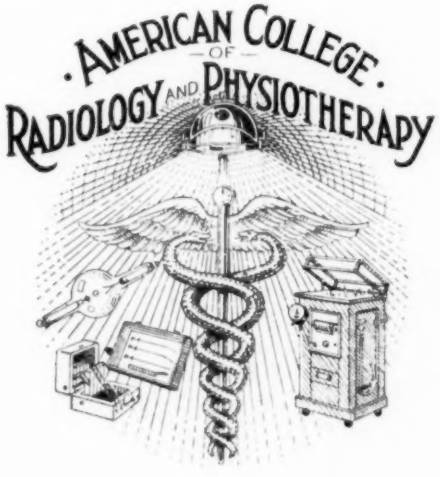
OCT 20 1924 Medical Lib

THE JOURNAL OF RADIOLOGY

Vol. V SEPTEMBER, 1924 No. 9



PUBLISHED MONTHLY

AT OMAHA, NEBRASKA

For Single or Double Screen Technique

Versatility is an important merit of the Patterson Cleanable Intensifying Screen. For it is so thin and pliable that it can be used as an upper or lower screen in single screen technique; or two Patterson Cleanables can be used in double-screen technique.

A booklet on the proper mounting of single and double screens will be sent on request, without charge.

PATTERSON SCREEN COMPANY

Dept. J. R. Towanda, Pa.

INTENSIFYING SCREEN
THE PATTERSON SCREEN CO
TOWANDA PA U.S.A.
X-RAY

Reg. U. S. Pat. Off.

The JOURNAL OF RADIOLOGY
Omaha, Nebraska

Vol. V SEPTEMBER, 1924 No. 9

The Question of Increase in Cancer *

H. E. EGGERS, M. D.

Department of Pathology,
University of Nebraska College of Medicine,
Omaha.

THAT there has been in recent years a noteworthy increase in the reported mortality from cancer is shown by the mortality statistics of the United States Census Bureau. The trend of this increase may be shown by the following figures, taken from the annual reports of that bureau, of the reported deaths from this disease in the registration areas for the respective years:

1906—70.8 per 100,000.
1910—76.2 per 100,000.
1914—79.4 per 100,000.
1918—80.3 per 100,000.
1920—83.4 per 100,000.

It must be borne in mind that this is the *reported* death rate, and as such may not reflect actual conditions. There is some reason to believe that more deaths are now being ascribed to cancer because of increased diagnostic skill, and because of medical attention being now more frequently sought for the aged. However, such explanations, while consoling, must of necessity be largely matters of opinion, since neither factor will admit of accurate estimation. Even so, the increase would appear to be too marked, and too regular, to permit explanation purely along these lines. Of other possible causes, the most obvious one is that of increasing age incidence in our population. Thanks probably largely to modern hygiene, there is no doubt that more individuals are now reaching advanced age, or in other words, the age of susceptibility to cancer. The interest in this matter of increased incidence of cancer lies largely in whether or not it can be explained by this matter of increased age—plus possibly the factors of greater statistical accuracy already mentioned—and to what extent there must be invoked as an explanation the increased operation of an etiological factor, or factors, as yet unknown.

Attempts have been made to evaluate cancer mortality statistics on the basis of the factors of increased age incidence and increased statistical accuracy, usually with the conclusion that these factors alone are sufficient to account for the increase. But such conclusions must of necessity be largely matters of individual opinion, albeit skilled opinion, and so do not carry conviction; indeed, the current belief in the medical profession is quite largely the contrary one.

There is however, a means of approaching the problem from quite a different angle, in that there is another group of diseases in which the factors of somewhat indefinite etiology, and of age as an etiological factor, play an important part. A comparison then of the mortality rates from these diseases, with that from cancer, should show whether or not some additional factor, as yet unknown, is operative for the latter disease. For such comparison, it is important not to restrict it to any one disease, since conceivably that disease might itself have some special factor becoming more or less opera-

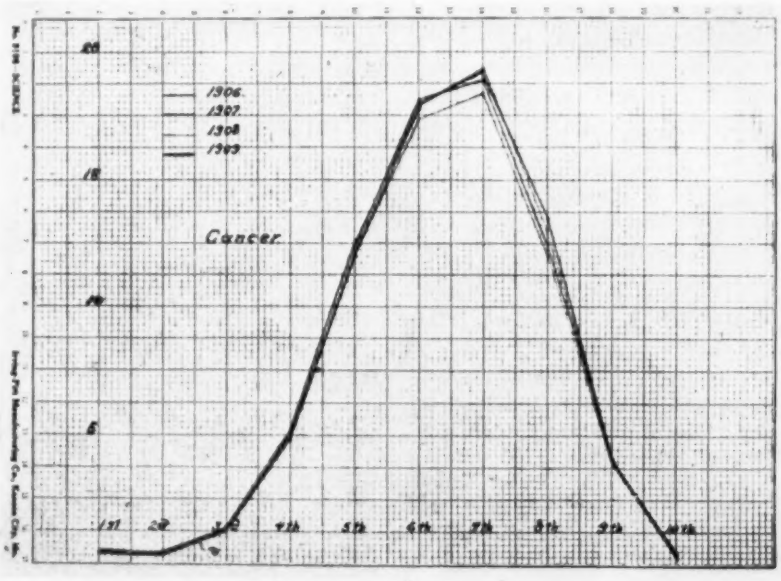


Fig. 1

*Read at a meeting of the Nebraska Academy of Science, May 1, 1924.

tive in the course of time. By selecting a group of diseases of this general character, this source of error is at least minimized, and the sum of these diseases, if properly selected, should be directly comparable with cancer. In selecting the list of diseases for comparison, the writer selected them not so much from the standpoint of age incidence as from that of obscure etiology, leaving the point of similarity of age incidence of the group as a whole, to that of cancer, to be compared later. The list of diseases so selected follows:

Chronic rheumatism and gout.
Diabetes.
Exophthalmic goiter.
Leukemia.
Anaemia, chlorosis.
Other general diseases.
Cerebral hemorrhage, apoplexy.
Epilepsy.
Organic heart disease.
Angina pectoris.
Disease of the arteries, etc.
Asthma.
Biliary calculi.
Bright's disease.

All data used were obtained from the annual reports of mortality statistics, of the U. S. Census Bureau, for the years from 1906 to 1920. They represent the statistics for the entire registration area.

In order to make a comparison of such a disease group, as regards age incidence, with cancer, it was first necessary to determine to what extent there was a characteristic age incidence, in various years, for cancer on the one hand and this group of diseases on the other. It may be said in passing that throughout this paper the word "cancer" is somewhat loosely used in the sense of malignant disease in general, principally since in many cases it is impossible to determine definitely by clinical means alone whether or not a case of malignant disease is carcinomatous (cancerous), or sarcomatous in character. If the age incidence of cancer, and of the group of diseases enumerated above, be expressed graphically, their coincidence in successive years is very striking. Figure 1 shows curves made for a number of successive years for cancer. Figure 2 for the group of diseases enumerated above which for brevity will be called the "constitutional disease" group; and Figure 3, inserted for purpose of comparison, for the infectious disease group. In making up the latter, all diseases of known infectious cause were included, and some in which an infectious agent, while not known, is undoubtedly responsible. Figure 4 is formed of the means of all the curves in Figures 1, 2 and 3, and admits of ready comparison of the age incidence of the various disease types. From Figure 4, it will be seen that while the infectious disease group presents a very characteristic age incidence curve, it is utterly dissimilar from those for cancer and the constitutional diseases, and that the two latter are on the whole very similar, running an almost exactly parallel course, but with the wave of cancer incidence slightly preceding that of the constitutional disease group. It may be well to call attention to the fact that the vertical coordinates of the three curves represent quite different values, adjusted so as to make the curves more readily comparable.

We have then in this "constitutional disease" group a number of diseases of rather obscure etiology (comparable in this respect with cancer) in which the age incidence is very similar to that of cancer; also in respect to accuracy of diagnosis, this group of diseases is fairly comparable with malignant disease. If then the factors causing the increased mortality from cancer are (1) those of increased diagnostic accuracy, and (2) an increasing proportion of the population of an age suitable for the disease to develop, since these factors will operate in practically equal degree to cause increased prevalence of the constitutional diseases, these should show a like increase in mortality rate. Any great divergence in

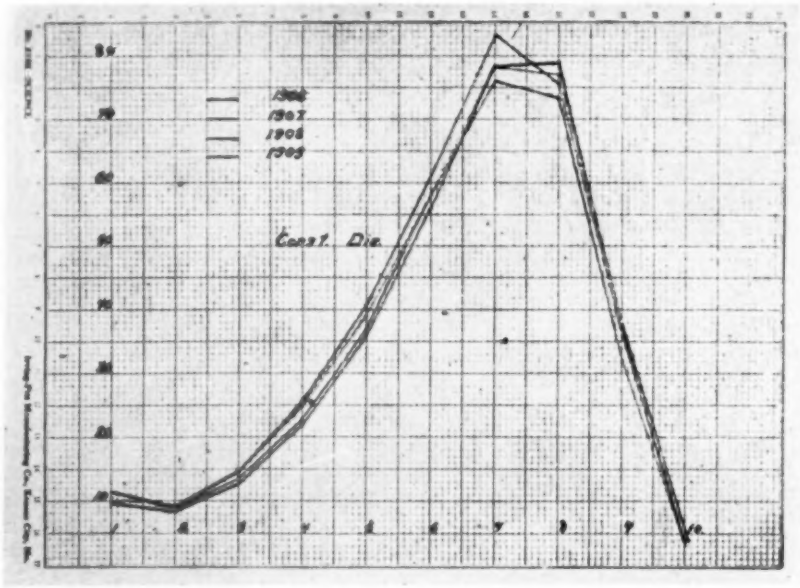


Fig. 2

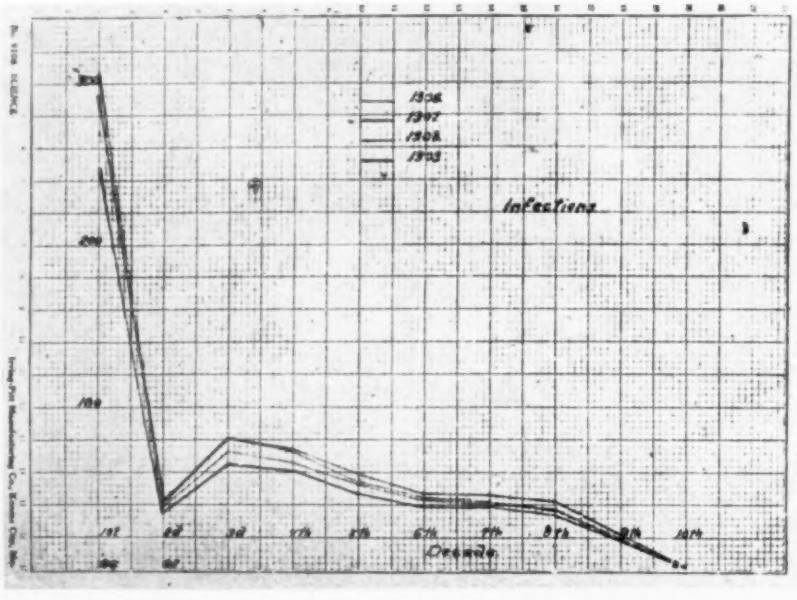


Fig. 3

the occurence of the two types of disease in successive years should, on the other hand, point to the operation of special etiological agencies.

In Figure 5 there is presented the annual death rate from cancer and from "constitutional diseases" from 1906 onward, again shown with vertical coordinates so expressed as to make them easily comparable. The death rate from infections is also included, to show its generally descending character—the principal explanation of why more people live to die later of the two former types of disease—and as an explanation, at least probable, of the one great point of divergence between cancer and constitutional disease rates. It will be seen that in general the two types of disease run parallel courses, both showing increased rates from 1906 onward until 1919, when the two diverge widely,—deaths from cancer in that year being disproportionately greater than from constitutional disease. Closer inspection of the curves will show that this disproportion results, not from any undue increase in deaths from cancer, (in fact, they are somewhat, though slightly, diminished from the year before) but to a very marked drop in the deaths from constitutional disease. The infectious disease curve suggests the explanation of this drop, in that there was a very great increase of deaths from infections in 1918, due to the influenza epidemic, an epidemic which would be particularly severe on individuals who were already suffering from chronic constitutional disease, and who, dying from influenza or its complications, would fail to appear in the mortality tables for the following year or years. This factor would presumably apply to a less degree to sufferers from cancer, in whom there would not be quite the same increased susceptibility to infection principally pulmonary in type.

From the close coincidence of the death rates from cancer on the one hand and what we have termed constitutional disease on the other, a coincidence that disappears to a marked degree only when a special etiological factor is operative in the case of the latter, it would appear that the death rate from cancer is showing only such an increase as should be expected in a population in which a successively larger proportion is failing to succumb to disease in earlier life, and is reaching an age in which senility becomes of importance in the development both of constitutional disease and of cancer.

In conclusion, it may be remarked that statistical evaluation of the data in the U. S. Census mortality reports is complicated by the fact that the registration area reported varies from year to year, on the whole being increased in extent, but suffering as well from the dropping of occasional states from the list. In a comparative study of this sort, it is felt that this does not vitally affect the results, since any changes in registration area would affect the rates for cancer and constitutional disease in presumably equal degrees.

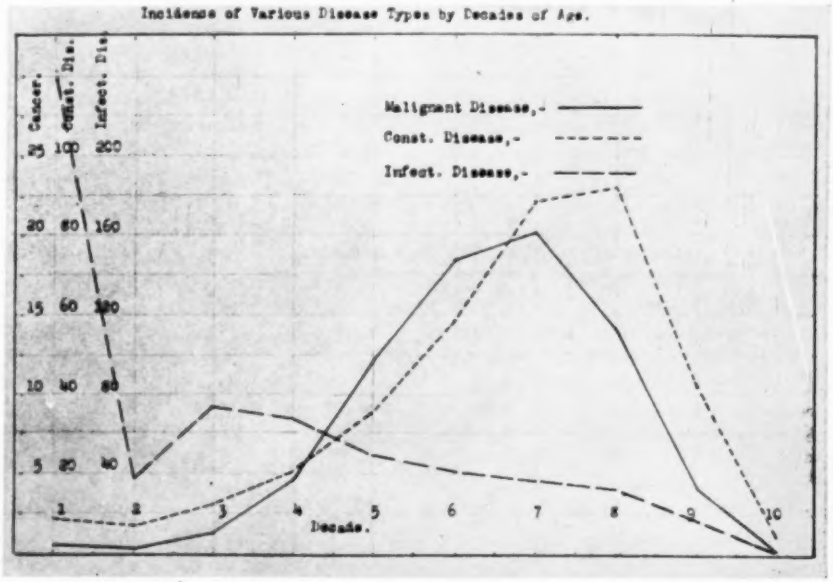


Fig. 4

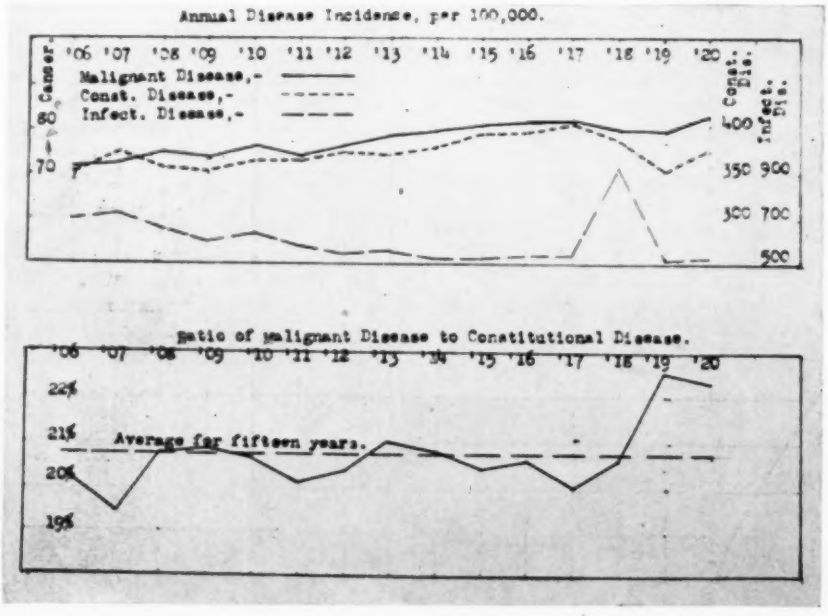


Fig. 5

Clinic*

A. P. CONDON, M. D.,
C. H. NEWELL, M. D.,
Nicholas Senn Hospital, Omaha.

Dr. Condon: We shall endeavor this morning, inasmuch as we do not limit ourselves to x-ray work, to present to you some radiograms which we hope will be of interest from not only a radiographic but a clinical standpoint.

The first case which we wish to present is that of a cervical rib. This condition of cervical rib is by no means as infrequent as one might think. Statistics show that it occurs in about .03 per cent of all cases. In other words in a town the size of Omaha there are probably 60 or 70 of these unfortunate individuals.

I say unfortunate individuals because such very distressing conditions may result if the rib is not removed and further the removal of a cervical rib is such a difficult and serious operation.

The symptoms arising from a cervical rib are due to one of two things. Either pressure on the cervical plexus or phrenic nerve, causing anything from mild tingling to complete paralysis in the upper extremity or even diaphragmatic spasm, or pressure on the subclavian vessels producing thrombosis, which may be either arterial or venous.

The operation for removal of the offending rib is very difficult because of the fact that the subclavian vessels, the phrenic nerve and the thoracic duct lie practically in contact with the rib. There are two classical ways of approaching this rib for its removal. One by a vertical incision behind the sternomastoid muscle and the other by a horizontal incision above the clavicle. I might mention in passing that this condition for some reason is much more common in the female.

In our experience we have had four cases of cervical rib which have produced symptoms, all of which have been due to a resulting thrombosis, three venous and one arterial. In one case there was in addition to the thrombosis a very distressing tingling in the upper extremity, which was later followed by almost complete paralysis.

When one of these patients presents himself for treatment the question arises as to what we can do to relieve the condition. Of course the removal of the cervical rib will not relieve a thrombosis which has already occurred, although it will probably relieve the symptoms due to nerve pressure. In considering the case which we wish to present to you this morning, I believe you will conclude that a removal of the rib before symptoms occur is the ideal procedure. This radiogram (Fig. 1) shows a typical cervical rib. I am going to show you also a photograph (Fig. 2) of this same patient. This woman came to us with the condition you see and almost a complete blindness. We had diagnosed a cervical rib in this patient six years ago when we discovered it in a radiogram taken for another purpose.

We did not remove the rib at that time and now she presents herself with this terrible condition which we think is a result of a thrombosis of both cavernous sinuses following continued pressure on the subclavian vein. The absence of fever made us think that the thrombosis was bland. Dr. W. K. Foote and Dr. John M. Bannister were called by us in consultation and they too concluded that this extensive thrombosis was present.

In this patient we did not resect the rib because the damage had already been done. We did, however, tie off the internal carotid, hoping thereby to lessen the pressure behind the thrombus and relieve the edema which was producing the distressing symptoms.

While this procedure was done more or less empirically, we were extremely gratified to find after a few weeks time that the patient had recovered about one-fourth vision on the side which corresponds to the internal carotid which was tied off. After this brief resume I think you will agree that a cervical rib should be removed when found and not be allowed to remain until symptoms appear. Had we followed that plan in this case, this patient would not be in the terrible condition in which she now is.

*Given at a meeting of the Interstate Society of Radiology and Physiotherapy, Omaha, December, 1922.

Fig. 1—Long cervical rib, right side; short one on left.
Fig. 2—Photograph showing swelling and discoloration about the eyes as a result of a thrombosis of the cavernous sinus following operation for removal of the cervical rib shown in Figure 1.
Fig. 3—Radiograph showing a large dentigerous cyst in the mandible, probably due to misplaced third molar.

Dr. Newell: I want to show you two cases of dentigerous cyst. We have had a number of these cases, but I would like to show you these two especially as they seem to emphasize two very important points in consideration of these cysts. A dentigerous cyst always arises from an embryonic or an incompletely developed tooth. This distinguishes this type of cyst from the usual bone cyst which may occur in any bone. This radiogram (Fig. 3) shows a typical cyst with an incompletely developed molar tooth in the bottom of this rather pear-shaped area which I am trying to outline before you. I call your attention to this very narrow line which indicates the thickness of what is left of the inferior mandible. This is so thin that by pressure upon it with the finger in the mouth one can elicit a crackling sound and feel, which is called the Ping Pong Ball sign.

Let me now call your attention to this next radiogram (Fig. 4). This shows a similar cyst but one which had become so large and had protruded so far into the mouth that several surgeons had made a diagnosis of sarcoma of the jaw. This photograph (Fig. 5) will give you some idea as to the extent of this tumor. However, upon the Ping Pong Ball sensation and the duration of the lesion, we made a diagnosis of dentigerous cyst and did not hesitate to remove one-half of this woman's lower jaw, including the cyst, and she made a nice recovery.

Now inasmuch as these cysts arise from an embryonic or incompletely developed tooth, it would seem that if all the teeth were present or at least could be accounted for, that it would rule out a diagnosis of dentigerous cyst. Now then let me call your attention to this radiogram (Fig. 6). This patient presented himself with the cyst that you see here and we thought that it was the usual bone cyst and so because these cysts are so frequently multiple we radiographed this patient's entire skeleton, but no other cysts were found. We then cut into the cyst and a section of the scrapings from the lining of the cyst cavity showed typical embryonic tooth cells. This of course labeled the lesion a dentigerous cyst.

Dr. Condon: This next case (Fig. 7) is of interest only because of a method of treating the condition which seems to greatly simplify the handling of such a patient. It shows a separation of the lower epiphysis of the femur in a child. This condition is not at all infrequent in children and for a long time we worried considerably over the treatment of these patients just as we did for a long time over the treatment of elbow fractures. Long ago we adopted, for the treatment of elbow fractures, the plan of Sir Robert Jones of putting the arm in acute flexion, instituting early active and passive motion and massage and since that time have had very little cause for uneasiness in the treatment of these patients as this procedure gives such uniformly good results.

Finally, in treating this patient whose radiogram I show you, it occured to us that we had here a condition analogous to fractured elbow, and we reasoned further that the treatment of this condition might also be analogous and decided to attempt the plan.

This fracture was reduced very easily, as it usually is, and the knee was then put in a position of acute flexion as indicated here (Fig. 8). Next a narrow band of adhesive tape was started on the patient's ankle and passed around the front of the thigh and returned again to the ankle (Fig. 9), thereby with a very simple dressing maintaining this condition of acute flexion. The little fellow was put to bed without any other dressing whatever, was allowed to turn, sit up, to roll over or in fact to assume most any position which he desired in bed and also to be out of bed on crutches. Then after about ten days this band of adhesive tape was lengthened, allowing some degree of motion in the joint. The patient was encouraged to use his knee to the extent of the motion permitted by the lengthened adhesive tape. Passive motion and massage were also instituted at this time. At three day intervals the adhesive was further lengthened, until at the end of four weeks the patient was able to put his leg in complete extension.

There was never a time after the first ten days when the patient did not have some motion in his knee joint. He was never distressed by complicated and unwieldy apparatus and was enabled in all to pursue a very happy course throughout his treatment.

Those of you who have had some experience in treating these patients by putting the leg in a cast and have seen what pathology has been produced in the knee joint will, I am sure, agree with me that the method I have just described is a great improvement over the older plan of treating these cases.

This next case is an exceedingly interesting one in consideration of x-ray examination of the kidney. This patient came to us complaining of pain in his right hypochondrium, extending around to his right kidney region and among other things, in

Fig. 4—Radiograph of a very large dentigerous cyst protruding into the mouth.

Fig. 5—Photograph of the patient shown in Figure 4.
Fig. 6—Radiograph of another dentigerous cyst.

his history, he told us that about two years ago a radiographic diagnosis of gall stones had been made and further that he had been operated upon in an attempt to remove the stones. The gall bladder was opened, drained and no stones found. He went home but little relieved of his condition. One year later he came to us complaining of pain in his right kidney region and very distressing bladder symptoms.

A radiogram at this time showed (Fig. 10) this large calculus in the region of his gall bladder and from this flat plate it was quite natural to conclude (had there been no history of previous operation) that here was a man who had a large stone in his gall bladder.

However, with a history of a fairly recent operation upon his gall bladder, at which no stones were found, we were compelled to pursue our investigation further. Several other x-ray men in Omaha were asked to read this plate with us and they too thought that this must be a stone in the gall bladder. Again they too, after learning the man's history, were rather inclined to doubt that this shadow was produced by a stone in the gall bladder.

We then took a stereoscopic radiogram of the right kidney region and it was very evident to all that the stone was really in the kidney. The point I wish to emphasize in presenting this case is that a diagnosis of right kidney stone should be made only by stereoscopic plates.

This fact was subsequently brought to us by a patient whose radiogram I now show you (Fig. 11). We nearly fell down on the diagnosis in this case. This patient presented himself with a large mass visible to the eye, in his gall-bladder region. This radiogram shows multiple discrete stones and these several areas of typical small gall stone masses. It occured to me that this stone especially, conformed roughly to the calices of the kidney and this fact prompted us to make further investigation. To make a long story short, this proved to be another case of multiple kidney stones in which the kidney tissue had practically disappeared, leaving nothing but necrotic tissue, pus and stones within the capsule of the kidney.

Let me just mention that this first patient had not only this large kidney stone, but also a stone in his bladder, which I show you here (Fig. 12), and also a stone in his ureter, which we removed.

Dr. Ghrist: "Doctor I would like to get your x-ray technique."

Miss McCoy (X-Ray Technician): "I used 30 milliamperes with a six inch spark compression and three-fourths second exposure with a double screen."

Dr. Ghrist: "Doctor would a skiagram with a pneumo-peritoneum help you there?"

Dr. Condon: I believe that it would not be of great help here. It is my idea that this technique should be used to bring out a shadow which is difficult to show by other means. In this case it is easy enough to show the stone, but difficult to localize it and I doubt that a pneumo-peritoneum would help. However, we are rather timid souls here and hesitate to use this method, except as a very last resort, and I believe that in such a case as this, one can make the localization without resorting to the other means."

Dr. Wood: "Doctor, would not the ureteral catheter help out there?"

Dr. Condon: "Yes, Doctor, undoubtedly an opaque catheter passed clear into the kidney would help to localize the stone, but even then a stereoscopic radiogram should be done because on a flat plate the opaque catheter might by chance lie just under the gall bladder shadow. Again my critisism of such a procedure is the same as of the one Dr. Ghrist mentioned. It is a serious thing to pass a catheter into a man's kidney and while we frequently have to do it, especially in making a diagnosis of ureteral calculus, we never do it except as a last resort."

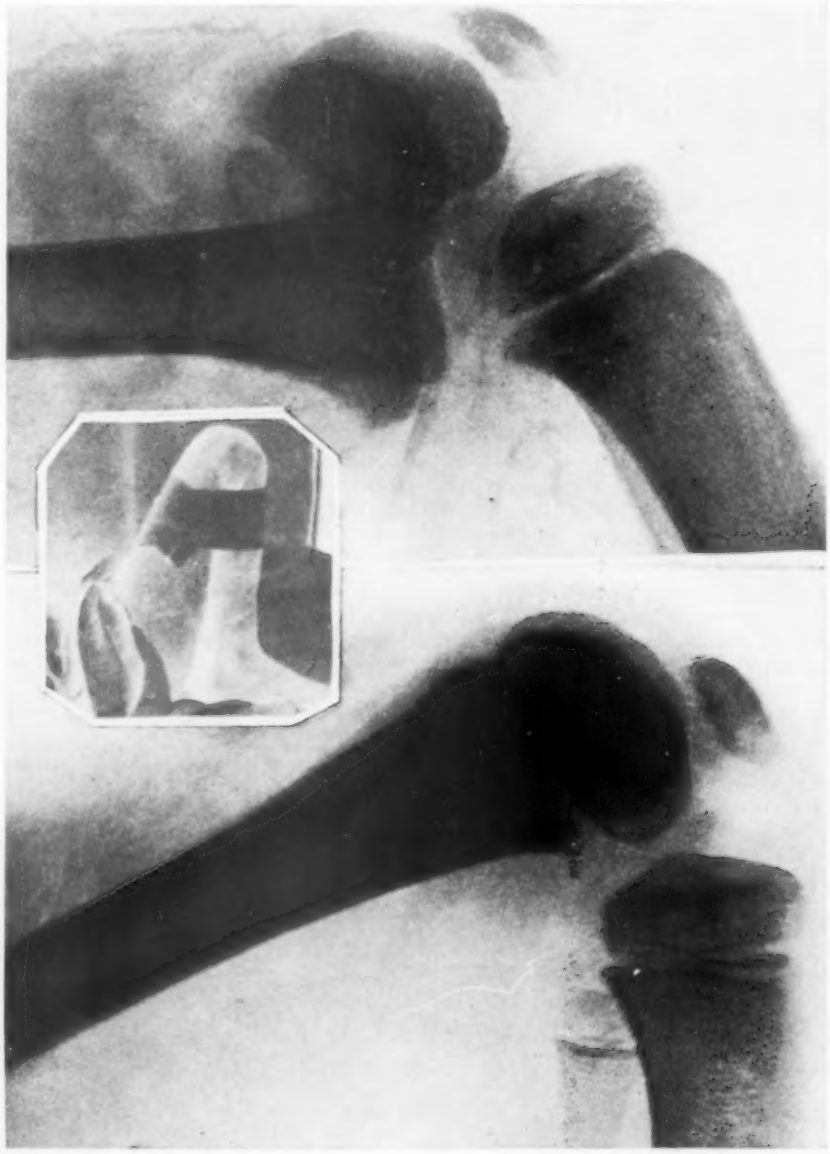


Fig. 7—Radiograph showing separation of lower epiphysis of the femur.
Fig. 8—Radiograph of the same patient after reduction and dressing with knee acutely flexed.
Fig. 9—(Insert) Photograph showing knee acutely flexed and dressing for maintaining this position.

Dr. Ghrist: "Doctor what about injecting sodium bromide or other opaque substance into the pelvis of the kidney?"

Dr. Condon: "Very good, but again the same objection, a serious procedure and to be done only as a last resort."

Dr. Condon (continuing): The next is a case of congenital hypertrophic stenosis of the pylorus (Fig. 13). The interest in this case is almost entirely clinical. The radiogram shows the typical pyloric obstruction with a large residue long after the stomach should be empty. I will not go into a detailed discussion of the clinical diagnosis of these cases, but will simply state that every babe with a persistent vomiting in its first few days or weeks of life, should be under suspicion until after a radiogram has been made. A clinical picture with this radiographic finding with or without the presence of a mass in the stomach region should establish a diagnosis of this condition. In nearly all of our patients a mass has been felt before opening the abdomen.

We have had some twenty-five or twenty-six of these patients so that we know the condition is not so infrequent and must certainly be overlooked very often.

Here is a condition which is very easily recognized (and the most important thing in the diagnosis is the radiogram) and I want to say to you that in our entire series, in only one case had the diagnosis been made or even thought of by the man who first saw the case. I do not mean that in every instance it remained for us to make the diagnosis, as a number of our patients were referred to us by Dr. Newell Jones, Dr. Floyd Clark, Dr. A. G. Dow and Dr. H. J. Murphy, and in each instance they had made the diagnosis, but the men who referred the cases to them, had not recognized the condition.

The point I wish to emphasize in this case is that these cases are very frequent and should be taken into consideration by the general practitioner when the clinical picture I have just described presents itself. I might add that the mortality in operation for the relief for these pa-

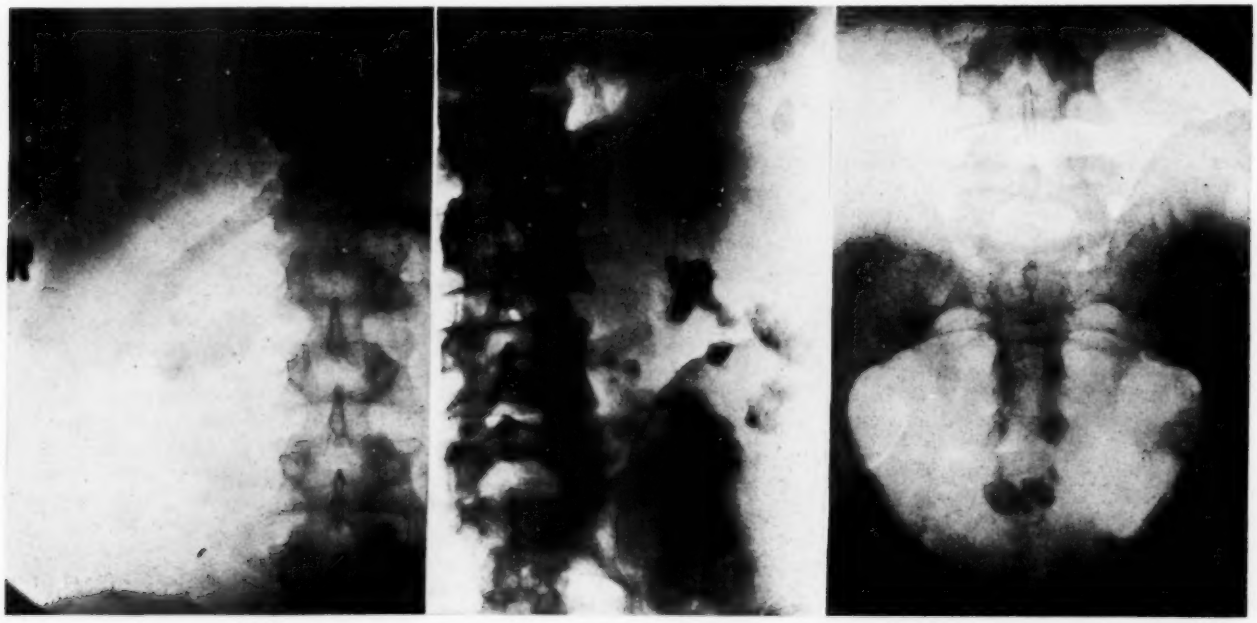


Fig. 10—Radiograph of kidney stone.

Fig. 11—Radiograph of multiple stones in kidney, some of which resemble gall stones. Differential diagnosis by means of stereoscopic x-ray films.

Fig. 12—Bladder stones.

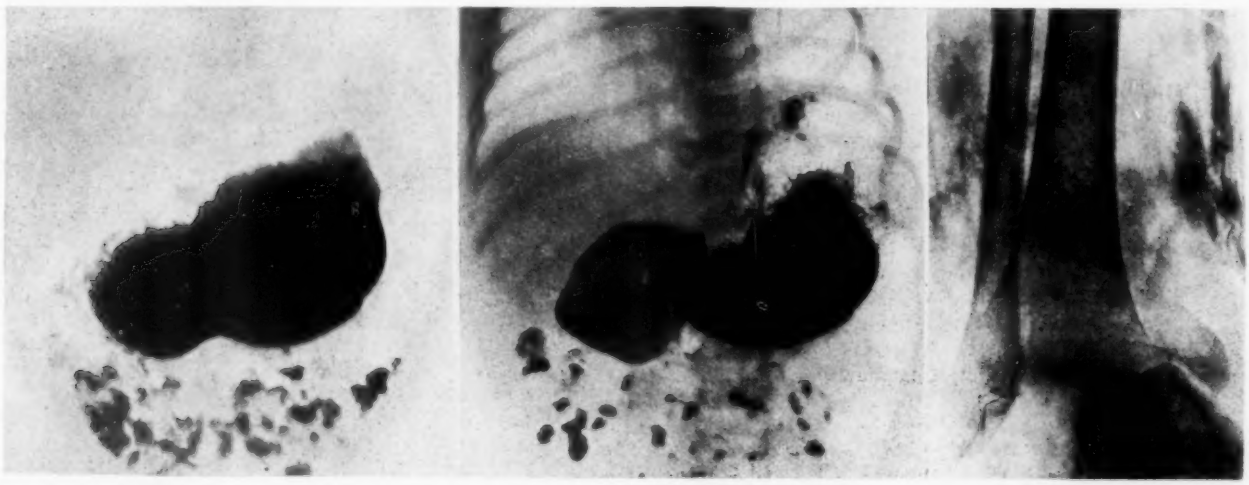


Fig. 13—Radiograph of baby with congenital hypertrophic stenosis of pylorus.

Fig. 14—Radiograph of baby with acute obstruction in third portion of duodenum.

Fig. 15—Radiograph showing inversion fracture of ankle with typical misplacement.

tients should be very low. Of course, if the patient is brought to the surgeon desiccated and starved the outlook is not so bright.

I call your attention to this radiogram (Fig. 14), which shows the different type of obstruction in a babe. This babe was only a few weeks old and a careful examination of the radiogram will show that it is not a pyloric obstruction, but that the obstruction is farther down. This was a case in which there was a congenital rent in the mesentery and a loop of jejeunum had passed through it and had become incarcerated there. This was relieved by operation.

Dr. Ghrist: "Doctor, can you feel any thickening through the abdominal wall in a case of this sort?"

Dr. Condon: "A thickening of the pylorus?"

Dr. Ghrist: "Yes."

Dr. Condon: "Usually you can feel the mass, but to find it is not necessary to establish the diagnosis."

Dr. Newell: This last case which we wish to show you is one of extreme importance, especially to the x-ray man, for here he will be enabled to save a patient much future trouble and the patient's doctor much chagrin, by recognizing the true condition in a picture of this kind. This is the so-called inversion fracture of the ankle and while it is rather uncommon, yet when it does occur it is usually not recognized and improper treatment starts the patient on a long course of trouble, terminating usually in a permanently crippled ankle.

In most patients in whom a fractured ankle is diagnosed, it is called a Pott's fracture, and without further thinking it is recommended that the ankle be put in a position of extreme inversion.

To Dr. John B. Murphy should go the credit for calling the attention of the profession to this very important condition. Briefly, the situation is this: A Pott's fracture always occurs when obtained with the foot in eversion. Referring to this drawing (Fig. 18), which is a very diagrammatic illustration of these two types of fractures, let me call your attention to the mechanics of the two conditions. You will note that in a true Pott's fracture the tibia, if broken at all, is broken through into the joint, external to the middle line. Such a fracture having occurred you can readily see that a position of extreme inversion would be ideal to replace this fragment in its proper position. On the other hand, in the case of inversion fracture, which is distinctly not a Pott's fracture, and which always occurs with the foot in inversion, you will note that the fracture in the tibia produces a fragment on the inner side of the bone. Now

Fig. 16—(Insert) Radiograph of inversion fracture mistaken for Pott's fracture, fragments nailed in position. Note that the astragalus is too far inward interfering with weight bearing axis.
Fig. 17—Radiograph of same patient after removal of nails and straightening of ankle as much as was possible.

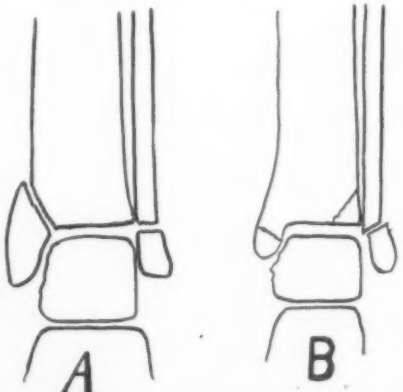


Fig. 18—Diagramatic drawings of (a) inversion fracture showing typical fracture of inner and outer malleoli; (b) Pott's or eversion fracture.

then, you can readily see that if this fracture is put up in a classical position for Pott's fracture, that instead of relieving the condition it really aggravates it and the fragment is pushed higher up on the shaft of the tibia than it already is, as a result of the fracture.

Whenever the radiologist discovers an ankle fracture, in which the fragment of the tibia is internal to the middle line, the doctor in charge of the case should be warned that if that fracture is put up in the classical position for Pott's fracture and is maintained there for a few weeks, in a hundred per cent of cases a badly crippled ankle will result. Here is a radiogram (Fig. 16) of a patient who came to us several weeks after having sustained a typical inversion fracture. She was attended by a very good surgeon in Illinois who failed to recognize the true condition and treated it as a Pott's fracture with this distressing result. She passed out of our observation and went to Dr. Murphy in Chicago who attempted, by open operation, to reproduce the fracture and to improve the ankle by getting the fragments back to where they belonged. In this, as you see here (Fig. 17), he was only partially successful. We saw the patient later and obtained this radiogram.

So here is a woman who must go through life permanently crippled as a result of a good surgeon failing to recognize an inversion fracture, which he should have recognized with the first glance at the radiogram.

Here is another such fracture (Fig. 15). This fracture had been diagnosed as a Pott's and had been put in a cast in a position of exaggerated inversion. This radiogram was made when the patient was sent in for "a picture to be sure everything is all right."

Dr. Condon: Gentlemen, we wish to thank you for coming here this morning and feel that in spite of our endeavor to keep away from the clinical discussion of these patients, we have failed largely to do so and that you, perhaps, as x-ray men have been somewhat bored during the hour. However, we appreciate greatly your courtesy in coming here and I want to assure you that it will always be a pleasure for us to entertain any or all of you. I thank you.

Nevi and Their Treatment by Radium *

HUGH MACKAY, M. D., C. M., F. A. C. P.,
Assistant Professor of Clinical Medicine (Dermatological Section), University of Manitoba, Dermatologist, Winnipeg General Hospital,
Winnipeg, Canada.

A NEVUS is a vascular anomaly of congenital origin involving capillaries, veins or arteries, producing dilatation of the vessel walls and implicating not only the vessels which are normally present in the part, but adventitious vessels which are projected into and form a part of the vascular mass.

While of congenital origin and usually appearing either at birth or in early infancy, their manifestation is sometimes delayed till adult life and occasionally until old age.

As a rule they increase slowly in size keeping pace with the body growth; when the full stature is reached the neoplasm ordinarily remains stationary.

At any stage in its developmental cycle clinical retrogression may supervene and the blemish be slowly and gradually effaced, without inflammatory reaction in the parts affected. Sometimes, however, localized inflammation with spontaneous ulceration sets in to be followed by slow healing and obliteration of the growth by the gradual deposition of scar tissue. This change is usually ascribed to trauma, or to direct infection of the nevus, but adequate proofs of the correctness of this hypothesis are lacking. The real and determinate cause of this remarkable transformation is shrouded in mystery. In a patient referred to me by Dr. J. E. Lehmann of Winnipeg, it was noted that the child was stricken with all the symptoms of an acute systemic infection, that thrombosis of the vessels was evidently the first pathological change, since no hemorrhage took place, although localized gangrene with extensive sloughing down to the deep fascia in the arm, together with abscess formation of the axillary glands ensued. See Figures 1 and 2.

Nevi may be classified anatomically as regards the parts invaded into: cutaneous, subcutaneous and mixed; as regards their clinical characteristics into, vascular and pigmented.

The capillary nevus is inset in the superficial layers of the epidermis. The color is red or purplish, the shade being determined by the development of the nevus from either the venous or arterial side of the capillaries. These lesions may be flat, level with the surface of the skin, or moderately elevated. Pressure ordinarily obliterates the vessels and blanches the tissues. The port wine stain or *nevus flammens* is usually of a red or violet hue. It is frequently seen on the face, sometimes on the extremities or trunk, and may be circumscribed or widely distributed.

The cavernous nevus presents itself as a soft boggy compressible, subcutaneous tumor; the overlying skin may be normal, but anomalies of the vascular supply in the skin are often noted. Frequently the superficial capillary type obtains in the epidermis, together with the deep or cavernous variety in the subjacent regions, giving rise to the capillary-cavernous form of the affection. The spider nevus is characterized by a dilated venule or arteriole centrally placed, while ramifying from this centre are several wavy lines which gradually fade into the surrounding tissue. Pigmented nevi vary in color from light brown to ebony black; they may be classified as follows:

Nevus spilus.—Smooth, flat, pigmented, macular lesions,—a simple staining of the epidermis, due to an abnormal pigmentary deposit locally.

Nevus pilosus.—Pigmented nevi covered with hairs which may be soft and downy, or stiff, coarse, and wiry.

Nevus verrucosus.—Pigmentary lesions with a warty or papillomatous surface with or without hair growth.

Nevus lipomatodes.—Are elevated pigmentary lesions with connective tissue and fat hypertrophy.

Nevus linearis.—Is a variety in which pigmentary or more commonly warty lesions develop in lines, frequently following the course and distribution of the nerve trunks.

TREATMENT OF NEVI

Carbonic acid snow is a valuable agent for the removal of the superficial vascular nevi. It is, however, rather painful and there is some danger of localized infection following its use. Radium is the remedy of choice for this variety. In the case of young children it may be applied during sleep. The dosage and technique should be carefully supervised. Scarring much more unsightly than the original lesion easily follows its injudicious use. For capillary nevi a 5 or 10 mg. plaque, the face of which is protected by oiled silk or dental rubber dam, is kept moving over the involved area allowing approximately five minutes for each square represented by the size of the plaque. It is desirable to avoid a marked reaction in the skin. The therapeutic charge should spend itself before further treatment is instituted. Six weeks is found a satisfactory interval between treatments. The deep or cavernous nevus may be treated with radium screened with 2 mm. brass held away from the skin by gauze or wood, one-half to one inch. The expedient of cross-firing, that is, attacking the growth at different angles, increases the therapeutic efficacy of the radium exposures. A more efficient method is the implantation of radium. Two or three steel needles, each containing 12½ milligrams of radium element are placed two centimetres or farther apart and buried in the mass from three to five hours. This method presents certain advantages. First,—the radium is in direct contact with the abnormal blood vessels. Second—the number of exposures are materially cut down. Third—transirradiation of the skin with its attendant cosmetic dangers is reduced to a minimum. Fourth—the cosmetic effect is better than by any other treatment. We have here delicate vascular endothelium bathed in a liberal blood supply and the stage is set for possible spectacular tissue changes from the radiation. In my experience no hemorrhage has taken place and no scarring in the path of the needle.

*Reprinted by permission from the Canadian Medical Association Journal, May, 1924.

In the case of young children it is wiser to administer an anesthetic; the skin is disinfected and perforated with a fine trocar. The radium needle threaded with silk, following the trocar track and entering at the periphery of the growth, is buried up to the eye in the neoplasm. In patients difficult to control there is danger of losing the radium. As a safeguard, two ligatures may be passed through the needle eye, one ligature is threaded with a curved surgical needle, noncutting edge, which is passed through the skin circumjacent to the needle eye. The ends are then securely tied; this anchors the radium. When the exposure is completed this ligature is cut out and the remaining one utilized to extract the radium needle. Three to four months should intervene between treatments by this method. In the management of spider nevi radium applied topically may be of service, but carbonic acid snow gives more satisfactory therapeutic results in my hands.

The port wine stain is a difficult blemish to remove. The superficial variety, the type which blanches on pressure, is sometimes responsive to radium, but the deeply infiltrated variety which pressure does not efface, demands an unfavorable prognosis.

Excision offers the best prospect for the removal of hairy nevi; if radiation is pushed to the extent of destroying the hair follicle, scarring is likely to ensue.

The pigmented nevi must be handled with caution or the latent malignant tendency may be aroused. It is usually better to leave these lesions severely alone or to excise them widely. Radium has a limited field of usefulness. Illustrative photographs are appended.

June 18th, 1921, Baby W. Age 10 months.—A large muff-like cavernous nevus of the left forearm; 9 cm. in length and nearly encircling the arm (Fig. 1). August 19, 1921—inflammation in the birthmark; child very ill; vomiting at times; temperature 102 4-5; gangrene set in, and sloughing down to the muscle planes; healing with fine scar formation followed (Fig. 2).

September 1st, 1921, Baby B.—Spontaneous ulceration of the upper margin of the right ear. The process was arrested by radium and healing took place.

June 20th, 1921, Baby T.—Cavernous nevus of the right cheek; two 12½ mg. radium needles introduced under the lesions entering through the mucosa of the mouth; three-hour exposure given, and in addition a 10 mg. plaque applied to the skin surface for 15 minutes. There was also a vascular nevus of the lower eyelid. On September 23, 1921, under anesthesia, this lesion was treated with a 10 mg. plaque and lead window screen, and a 20-minute exposure given. This was followed by obliteration of the blemish without scar formation. On the same

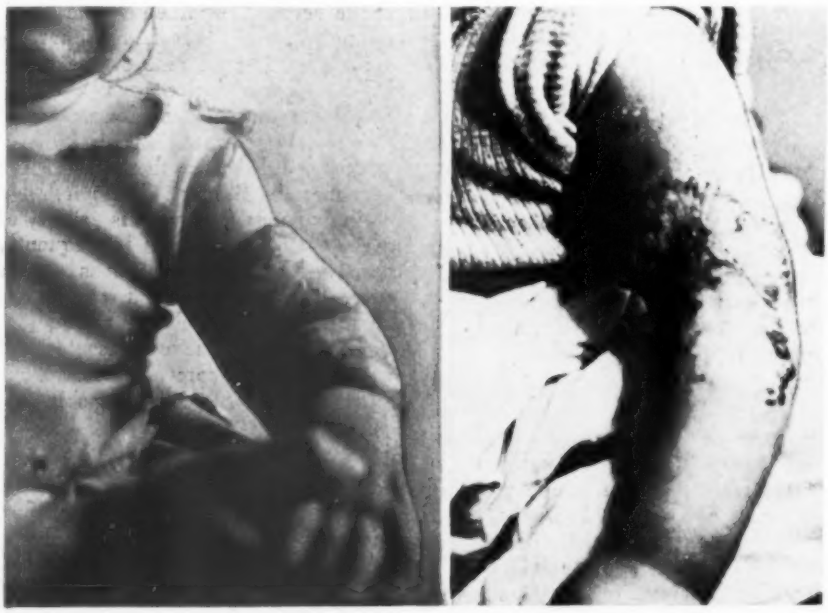


Fig. 1—Baby W. Cavernous nerve of the arm and forearm.
Fig. 2—Baby W. Scar after spontaneous ulceration and healing of the lesions. Function of limb unimpaired.

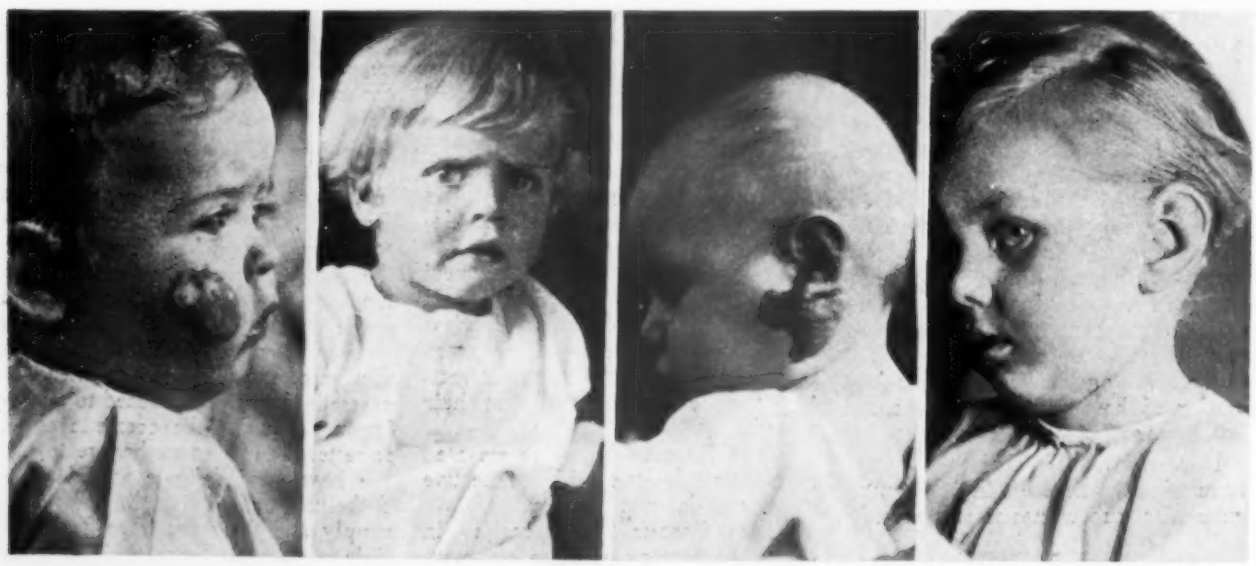


Fig. 3—Baby T. Cavernous nevus before treatment.
Fig. 4—Baby T. after treatment.
Fig. 5—Baby G. Cavernous nevus.

Fig. 6—Baby G. Cavernous and capillary nevus of ear and face after radium treatment.

date, the spot on the cheek was treated with a 10 mg. plaque for one hour. The same exposure was given on February 11th, 1922, and again on June 21st, 1922 (Figs. 3 and 4).

October 12th, 1921. Baby G.—Age 4 months. A capillary cavernous nevus involving the left side of the neck and both surfaces of the ear. The main part of the tumor was 5x6 cm. in the extremes and elevated 1 cm. above the skin surface. Two 12½ mg. needles were inserted into the vascular tumor and a four-hour exposure given, after which the lesion was gradually reduced in size. December 21, 1921—radium 10 mg. plaque applied to capillary nevus of the ear for 30 minutes, moving. June 23, 1922—two 12½ mg. needles inserted for five hours; October 14th, 1922—two needles inserted for 4 hours; February 24th, 1923—radium 10 mg. plaque for the capillary nevus 2 hours; May 25th, 1923—radium 10 mg. plaque three hours; August 20th, 1923—radium 10 mg. plaque two hours (Figs. 5 and 6).

Mrs. H., age 68.—Consulted me March 7th, 1922; a nevus, angle of the mouth, left side; with malignant degeneration; two 12½ mg. needles inserted subcutaneously at the edge of the ulcer, one on either side, and a five-hour exposure given. A letter, October 9th, 1923, stated: "The face healed thirty days after the treatment and has remained perfectly well, with very slight scar."

It should not be forgotten that over-radiation carries in its train embarrassing sequelae which may find expression in a radiodermatitis, ranging in intensity from a transient erythema to deep and intractable ulcerations, to be followed later by telangiectasia, depigmentary changes, cutaneous atrophy, or keratoses, and ocasionally malignant degeneration.

BIBLIOGRAPHY

Sequeira, *Diseases of the Skin.* Crocker, *Diseases of the Skin.* New, Gordon B., *Lancet*, July 1st, 1917. *Annual Reports*, Radium Institute, London. MacKay, Hugh, Studies in Radium, *Canadian Medical Association Journal*, Sept., 1922.

Non-Malignant Diseases of the Jaw *

WILLIAM L. SHEARER, D. D. S., M. D., F. A. C. S., and
ALBERT F. TYLER, B. Sc., M. D., F. A. C. P.
Omaha

THE jaws are subject to non-malignant diseases of a very interesting series. Some of these are similar to disease of bone in other parts of the body, while others are peculiar to the jaws themselves. The latter are found in the jaws because of the anatomy peculiar to them. The anatomy gives rise to certain developmental anomalies and diseases not found elsewhere.

1. ATROPHY.

The jaw bone is composed of two portions, the one essentially permanent in character and the other transitory in character. The latter is that portion of the bone called the alveolar process. The alveolar process is made up of cancellous bone in which are found the tooth forming organs which dip down into its substance during embryological development as invaginations of the epithelium covering it. These are called the tooth buds and from them the teeth develop, the crown forming first, and the roots later, gradually pushing the crown toward the surface.

It would seem then that the function of the alveolar process is to act as a proper seat for the teeth. As soon as the teeth have been lost nature begins to absorb the process. Naturally this is a slow, time-consuming method and many times a narrow knife-like edge of the process remains permanently. This can be felt with the finger and demonstrated on the roentgenogram and is a frequent cause of pain when an attempt is made to wear artificial dentures.

If nature has completely absorbed the alveolar process the permanent portion of the jaw bone remains but of course is much narrower than before the process disappeared. This type of jaw with much decrease in the lime salts is found in the elderly who have been without teeth for many years. The whole process may be considered a physiological one.

2. OSTITIS.

Ostitis may begin as a periostitis or as an osteomyelitis. In either case the invading organism is of low virulence so that the disease invades

*Received for publication December, 1923.

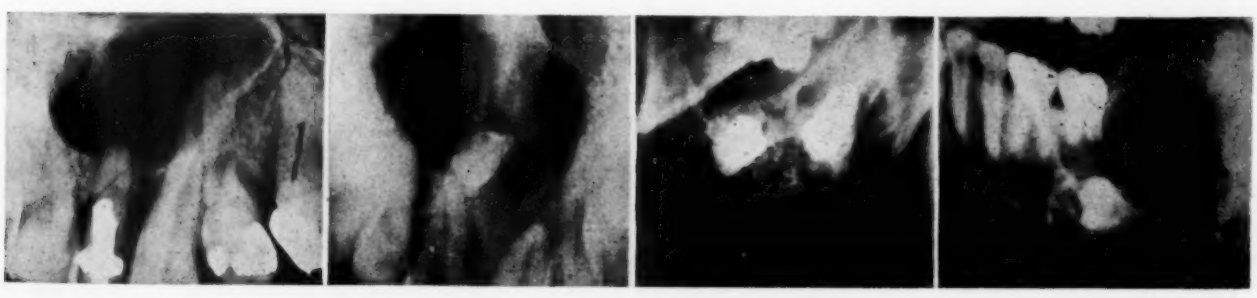


Fig. 1—Radicular cyst originating about the apex of a devitalized tooth. Note the size and the clearly defined wall which distinguishes it from the single granduloma.
Fig. 2—Periodontal cyst containing misplaced tooth. This cyst came to the surface labially in the upper central region where the characteristic paper-like feeling was elicited.
Fig. 3—Periodontal cyst of the multilocular type containing two unerupted misplaced molars.
Fig. 4—Periodontal cyst of the multilocular type. The third molar is unerupted and misplaced. The roots of the second molar are absorbed.

the bone slowly cell by cell but gradually a considerable area of bone becomes involved and some pus appears, the area showing on the roentgenogram as a localized bone destruction. Not only is the cancellous portion of the bone affected but the entire substance of the bone.

3. Osteomyelitis.

Osteomyelitis is more often found in the mandible. The process begins in the cancellous portion of the bone and spreads rapidly, invading a large area or even the entire bone. The most frequent source of this type of infection is compound fracture of the jaw. Occasionally osteomyelitis develops from a root-end abscess. Considering the great number of root-end abscesses and the small number of cases of osteomyelitis this cause may be considered rare.

Another form of osteomyelitis is rare but extremely serious. We speak of that due to Vincent's fusiform spirillum. Vincent's fusiform spirillum is frequently present in the mouth and is often found in great numbers in pyorrhea pockets. When one finds the periodontal membrane separated both from the tooth and from the tooth socket, feeling to the probe like a veil of jelly in the pyorrhea pocket, bone infection is sure to follow simple extraction. Only complete surgical removal will obviate this sequel. It is extremely dangerous to extract the teeth in the presence of this type of infection. The denuded surfaces produced by extraction serve as an avenue for the infection which rapidly invades and destroys bone. The most painstaking treatment then seems to be futile, the infection rapidly progressing until the whole jaw is involved. In a case recently under our observation the whole upper and lower jaws were destroyed, many sequestra forming and even opening into the antrum of Highmore. Only the patient with a most rugged physique can survive such an attack. In most cases the outcome is fatal.

4. Necrosis.

Necrosis is a term used to designate death of bone of the jaw in large masses. This may be the result of an osteomyelitis as described above or it may be caused by chemical substances such as mercury or phosphorus. As the process progresses sequestra separate out and must be removed. These show on the roentgenogram as localized irregular areas of bone which appear more dense than the surrounding bone. This fact is due to the sequestra being shut off from the circulation so that the quantity of lime salts found in them at the time separation occurred remains unchanged while a general absorption of the lime salts in the surrounding bone continues to progress.

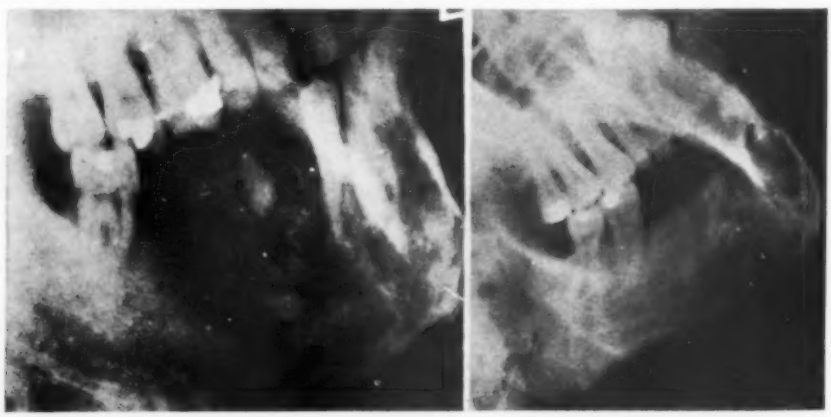


Fig. 5—Extensive destruction of the jaw bone due to osteomyelitis following the "pulling" of a tooth.
Fig. 6—Localized bone destruction in lower central region due to ostitis.

5. Actinomycocis.

Actinomycosis is due to infection with the ray fungus, the specific cause of the disease. It is more frequently found among farmers or those who are closely associated with cattle and horses. A common custom among such men is the chewing of straw or hay as they go about their work. This is the source of introduction of the fungus into the mouth, and, if an abrasion in the mucous membrane is present, trouble follows. The soft tissues of the jaw, cheek and neck become invaded first, with involvement of the bone later. Bone involvement is shown on the roentgenogram as a localized area of decalcification. In other cases the fungus enters a pyorrhea pocket. In these cases the bone infection is first and that of the soft tissues is secondary.

6. Cysts.

(a) Periodontal or radicular cysts: This type of cyst is an end-result of a certain small percentage of periapical abscesses or granulomas. The fibrous wall of the granuloma becomes thinned out, in the opinion of some, being digested by the pus organisms inside its own walls. As this process continues, pressure is increased within the cavity and the surrounding walls are slowly invaded and absorbed. Since this type of cyst has infection about the apex of the tooth as it's cause, one will find the root end of a devitalized or dead tooth projecting into one side of the cyst cavity. In some cases the dead tooth may have been extracted without the cyst being recognized. In other cases previous extraction may have occurred leaving a granuloma in the jaw which continues to progress and results in cyst formation. In fact, many cases have been observed by us in which the teeth had been removed five to twenty years previously and in which granulomas were demonstrable on the roentgenogram and later proved at operation.

Fig. 7—Localized bone destruction in lower molar region due to actinomycosis which had gained entrance through a pyorrhea pocket.

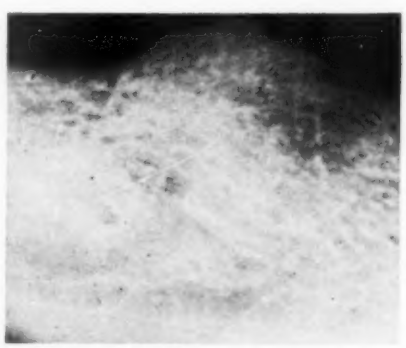


Fig. 8—A portion of the alveolar process has failed to absorb within 22 years after the teeth were extracted. Patient unable to wear artificial denture. Surgical removal gave relief.

The periodontal cyst is usually relatively small and is usually all in one cavity but occasionally one finds the multilocular type. The roentgenogram reveals the clear cut wall of the cyst together with the trabeculae if any are present.

(b) Dentigerous cysts: This type of cyst is much less frequent than the periodontal type. In this case the cyst develops from the tooth follicle. Present in it or near it is always an impacted, misplaced, unerupted or supernumerary tooth or follicle. These cysts then are developmental anomalies, the presence of some stray tooth often giving the clue to the differentiation from the periodontal type.

Dentigerous cysts are relatively large and in fact may assume unusual size. One case under our observation extended from the angle of the lower jaw on one side around to the angle on the opposite side. Although they may attain such large size they develop slowly.

Dentigerous cysts are usually multilocular, the wall and the trabeculae being clearly visualized in the roentgenogram. In some cases even these cysts become infected due to extracting a tooth or incising under a mistaken diagnosis.

7. Osteoma.

These are bone tumors of very slow growth which are usually found on the lingual surface of the mandible or the palatal surface of the maxilla. They are composed of dense, cortical bone so show on the roentgenogram as areas of increased density.

Symptoms and Physical Findings.

(a) Atrophy: Clinically this is manifested by the disappearance of the alveolar process and narrowing of the jaw. The roentgenogram reveals the same condition but in addition shows the general absorption of lime salts.

(b) Ostitis: Clinically there will be a history of a previous acute tooth abscess or previous dental operation followed in time by a dull ache in the jaw. The superimposed soft tissues become edematous and swollen and the diseased area tender to pressure. The roentgenogram shows the area of decalcification.

(c) Osteomyelitis: There will be a previous history of compound fracture of the jaw, dental operation or abscess of the tooth. The soft tissues become inflamed, edematous and swollen while the patient experiences much pain and is unable to masticate comfortably if at all. Pus exudes from the open wound and the probe reveals denuded bone. The roentgenogram after the disease has been present about two weeks shows bone destruction, frequently associated with sequestrum formation.

(d) Actinomycosis: The patient appears with the history of a slowly advancing low grade inflammation of the soft tissues of the cheek and neck. The tissues become indurated and feel board-like. Later, small elevations appear which soon become soft and when punctured a straw colored fluid exudes in which will be found the hard gray granules characteristic of the disease. These sinuses remain open and others form as the disease advances. When the bone becomes involved the patient feels a dull ache followed by a tender area which sooner or later breaks down and discharges a fluid similar to that described above. At this time the roentgenogram shows an area of decalcification corresponding to the location of the lesion.

(e) Cysts: Cysts are almost symptom free but if large there may be a dull ache in the jaw. The bone becomes thicker than normal and if the cyst comes close to the surface of the cortex the finger of the oral surgeon will detect a swelling which has a papyraceous feeling when compressed. The roentgenogram reveals the clear cut area of decalcification.

(f) Osteoma: One can see and feel the mass projecting from the side of the jaw and the roentgenogram will show a definitely outlined area of increased density corresponding to the location of the tumor.

Treatment.

(a) Atrophy: No treatment is needed for this condition except when nature has failed to complete her task and has left a knife-like ridge of alveolar process which interferes with the wearing of artificial dentures. In this case under [illegible]caine-adrenalin nerve-block a[illegible]a with the patient recumbent, [illegible]ncision is made through the [illegible]coperiosteum parallel to the ridge. The mucoperiosteal flaps are laid back with an elevator exposing the ridge to view.

Fig. 9. Photograph of patient with actinomycosis involving soft tissues at angle of the jaw.

This is then chisled off and smoothed with the special rongeur forceps. Bleeding is stopped, after which the flaps are brought back together and sutured with horsehair. The sutures are removed in four to seven days, healing occurring by primary union.

(b & c) Ostitis and osteomyelitis: The treatment of both these conditions must be conservative in nature. The policy giving best results seems to be irrigation with hot 0.5 to 1 per cent lysol solution twice daily followed by careful removal of sequestra as they become loose. These types of infection in the jaws require long periods of time for recovery. He who attempts to hasten the progress by active surgical interference will find the patient in worse condition than before treatment.

(d) Actinomycosis: The treatment of this disease demands the use of medicine, surgery and roentgen rays. When bone involvement is found the diseased area should be thoroughly removed. This can usually be done under novocain-adrenalin nerve-block anesthesia. An incision is made through the mucoperiosteum which exposes the diseased area clearly to view. The disease is then thoroughly curetted down to healthy hard bone, bleeding is stopped and the wound is wiped out with tincture of iodine, after which the flaps are closed over. Daily irrigations are given until healing has occurred.

At the same time this treatment is being carried out, x-ray treatment is given over the indurated area in the soft tissues. As areas of fluctuation appear they are incised, drained and wiped out with tincture of iodine.

Immediately upon making the diagnosis the patient is given potassium iodide internally to physiological effect. This is continued until all induration has disappeared from the soft tissues and complete healing has occurred. Our custom is to continue the medication for two months after clinical evidence of the disease has disappeared.

(e) Cysts: With the patient recumbent, novocaine-adrenalin anesthesia is induced, after which an incision is made through the mucoperiosteum just below the cemento-enamel junction of the teeth and long enough to give easy access to the cyst. The mucoperiosteal flaps are laid back and the necessary teeth carefully removed. The opening through the cyst wall is carefully enlarged and the cavity wiped out. Careful inspection must be made to determine the position of the mandibular nerve, since in large cysts of the mandible the nerve frequently passes through the cyst cavity. Misplaced teeth are then removed, the cavity carefully curetted and packed with a continuous strip of one-fourth inch iodoform gauze soaked in olive oil. The flaps are then sutured loosely with horsehair. On the second day the pack is carefully removed, following which the cavity is irrigated with hot lysol solution. Irrigations are continued twice daily till the cavity closes.

(f) Osteoma: After nerve block anesthesia has been induced an incision is made in such a position as to preserve the circulation in the flap and at the same time expose the tumor. The mucoperiosteal flap is turned back and the tumor carefully chisled off. The flap is then closed with horsehair sutures which are removed in from four to seven days.

Diagnostic Problems of Minor Injuries to the Spine *

LEE W. RORK, M. D.
Hastings, Nebraska.

MANY factors in recent years have contributed to make the diagnosis in minor injuries of the spine one of the most complex and perplexing problems the radiologist has to encounter.

He is called upon by the insurance companies operating under the workman's compensation law, to determine the presence or absence of a constantly increasing number of injuries to this part of the body. Also to give an opinion as to the permanency of such disability.

On the one hand an embarrassingly large number of cases are sent in with the statement of one to several dislocations present in the vertebral chain. These cases are not sent in by the persons making such diagnosis but by a representative of the insurance company or the individual on whose person certain adjustments are to be made, and often being of an inquiring turn of mind he desires to learn for himself the nature of the represented disability.

On the other hand we encounter the opinion that all disabilities of the back, where there is not evidence of a cord lesion present, are lumbago in the lumbar region, intercostal neuralgia in the dorsal, and torticollis in the cervical.

That partial dislocation can and does occur without cord destruction or compression is an established fact, also that lumbago, intercostal neuralgia and torticollis occur as the result of focal infection, has been demonstrated.

The clinical uncertainty regarding injuries of the back, renders the conclusions of the radiologist of the greatest importance in the settlement of claims for disability and assists the clinician by giving him more exact data as to the pathology of the part involved.

In arriving at these conclusions the examiner must take into consideration the anatomical structure, anomalies, age changes, disease changes and changes which occur from the time of injury to the time of examination, also the differentiation between recent and remote injury.

The anatomical structure of the vertebral column, in short, is composed of twenty-four movable segments interlocking with each other by their articular processes, with the insertion of the flexible intervertebral disks between the bodies. Held together by a complex and powerful system of ligaments, this constitutes one of the strongest parts of the body framework. However the very mechanism of its construction, with the multiplicity of articulations, ligaments and muscular attachments, although very resistant to trauma, is quite susceptible to injury by muscular action. This is brought about by stretching or lacerating the ligaments and in over extension or flexion accompanied by rotation, which one of our greatest authorities has defined as a first degree dislocation, or fracture, commonly called a sprain.

*Read at the meeting of the Nebraska Radiological Society, Omaha, May 12, 1924.

The lumbar region is more susceptible to this injury than are the other divisions. The injured individuals describe the lesion in almost as many ways as there are individuals injured.

In examining these cases by plates taken stereoscopically it is surprising how many show a partial displacement of the articular processes at the point of injury. As far as I have been able to learn, the only significance of this manifestation is the evidence of a sprain. It would be natural to infer that the damage to the ligaments might establish a tendency for the same injury to occur at some future period, as is the case in sprain of the wrist or ankle.

Another factor which the investigator must constantly keep in mind is the commonness in which asymmetry is encountered. Taking the spine as a whole or in its separate divisions curvatures are practically the rule. They are spoken of as vocational, postural, or as the result of old leg injuries. As to the changes observed in the individual segments and in their relation with each other, a majority of them might be described as developmental. When we consider that at least sixty per cent of children suffer from malnourishment during the first two years of life during which time the individual assumes the erect posture and thereby places a greater strain on the vertebral bodies than on any other part of the osseous system it is not remarkable that asymmetry is the rule rather than the exception.

Anomalies are not infrequently met with the most common is the occult spina bifida which is usually encountered in the lower lumbar segments. The clinical importance of this condition is questioned except that the non-fusion of the spinous processes might be mistaken for a fracture.

The sacralization of one or both of the transverse processes of the fifth lumbar is not an uncommon finding, but no clinical significance is thought to be attached to it.

Hypertrophic changes which are observed in many individuals over fifty years of age are to be taken into consideration in connection with injuries to the vertebrae. I would hesitate to say that this was a normal manifestation at this period of life but its presence should not be construed by itself as evidence of injury. However, taken in conjunction with a history of an injury received at a rather remote period from date of examination and corresponding as to location with the affected segments, it would render the diagnosis as to whether the injury was responsible for the hypertrophic changes extremely difficult. A short time ago a case of this nature was referred to me for examination. A man sixty-two years of age fell and sustained an injury corresponding to the lower dorsal and upper lumbar segments. The balance of the vertebral segments were singularly clear of changes. In this case the evidence was easy to determine but had there been changes showing in the other segments it would have been quite a different proposition.

The differentiation between a recent injury and an early tubercular involvement may be a source of perplexity. If the typical non-bone-producing involvement of the articular surfaces can be determined the problem is easily solved. However this often cannot be demonstrated in the early stages. When the body softening occurs with the resulting angulation, the diagnosis can be firmly established.

A condition which is said to be found not infrequently but which has been very uncommon in my experience is spondylitis giving a history of a slight trauma and usually short disability, with no apparent radiological evidence of injury. The individual often resumes his work for a time and then gradually a complete disability develops. At this period the presence of a rarefying ostitis evident on radiological examination would develop a most embarrassing situation, particularly if an x-ray record of the early disability was not in evidence.

A routine radiological examination should be made of every spinal injury encountered. I would emphasize the importance of stereoscopic examination. If no evidence of disease or injury can be elicited in the tract itself, then the examiner should search for evidence of focal infection. Many of the displacements which the adjusting cult so diagnose can be reduced by the extraction of an offending tooth.

The radiologist has a peculiarly fortunate opportunity for an accurate and comprehensive study of this problem of which much capital and prominence has been made in recent years. It has been the source of much distortion and misrepresentation for financial gain on the one hand and too much ridicule on the other. We have the opportunity of seeing the picture upon both sides. That there is too little of accurate knowledge upon the subject is obvious. Conservatism and honest research will go far in solving this rather awkward situation.

Deciduous and Developing Teeth *

WILLIAM A. LURIE, M. D.,
New Orleans.

IN the interpretation of the dental roentgenogram, one must ever be on the lookout for an unusual appearance or finding in a commonplace situation. Many times deep mysteries as to origin of symptoms may be cleared up through the finding of a deciduous tooth which was never replaced by its permanent successor.

The several stages in the development of teeth can be readily pictured so that it is a simple matter to make an individual study of such teeth or a comparative study of those on one side of the jaw with the similar ones on the other. Such a study is very enlightening and is an easy way to trace the several stages of tooth eruption.

Interruption in the development and growth of the tooth may take place at any time, for local bone conditions or the presence of deciduous teeth may deflect a growing tooth so as to prevent its eruption into normal or even nearly normal position. The early finding of these abnormalities precludes the early correction or even the prevention of deformities. It is therefore essential to know the teeth that should be erupted and the approximate age of their appearance, as well as the time that the apical ends of the teeth are fully developed and the root canal narrowed.

*Received for publication July 11th, 1924.

One can hardly imagine the errors that occur in diagnosis through the finding of an incompletely developed tooth and the diagnosis of the apical condition as being an infection. Likewise the finding of a well formed deciduous molar without root absorption, in the position a bicuspid should occupy. Through a lack of knowledge of the time nature takes to effect these changes and a corresponding lack of knowledge of what the conditions should look like, mistakes are bound to occur. Add to this lack of knowledge the fact that infection may take place at any time and may destroy the various tissues in any direction, and you may form an idea of the importance of understanding the dental roentgenogram of deciduous and growing teeth.

Figure 1 pictures the jaw of a child of about nine and a half years. Note that all the deciduous teeth are in place and that the first molar (permanent), often termed the six year molar, has a fully developed crown which has grown to the level of the crown of the adjacent deciduous molar. Note also the difference in penetration in the two deciduous molars pictured, the first being much lighter than the second. This difference is due to the breaking down of the tooth and the loss of organic salt content in the tooth substance, so that in penetrability it approaches the resistance of soft tissues or Grade I shadow. However, the outline of the tooth can be made out, and yet while not as heavy as the Grade IIb shadow seen in the first molar nor in the crowns of the erupting teeth the shadow is smooth and without structural appearance and therefore classed as Grade IIb.

Comparing now the appearance of the two unerupted bicuspid teeth, and particularly the appearance of the tooth bud wall over their crowns, attention is directed to the greater extent of space pictured between the tooth crown in the first bicuspid and the tooth bud wall as compared to that in the second bicuspid. Attention is further directed to the level of development or growth of these two teeth. The first bicuspid, under the lighter molar is further advanced, and the tooth crown and bud have pushed themselves into the space between the roots of the deciduous molar, and absorption of the roots has begun. The first bicuspid is longer than the second and a better development of root walls with the beginning formation of the pulp chamber and root-canal can be made out in the picture.

This print is a bit faulty in that it does not picture the alveolar process about the lower portion of the picture as clearly as it should. However in the film the alveolar structure could be definitely made out. This of course is shadow of Grade IIa type. To the lower left corner of the picture the erupting cuspid can be made out. This tooth will not be discussed because this picture was not intended to portray that tooth. However, attention is called to it because of its presence and its pictured prominent cusp which is characteristic of the cuspid tooth.

Fig. 1

Fig. 2

Fig. 3

Fig. 4

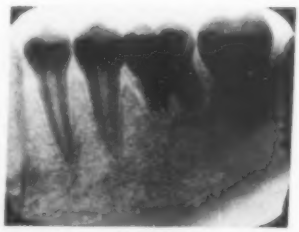


Fig. 5

Now, calling your attention to the appearance of the apex of the mesial root of the first molar: The apex is not completely formed and the remnants of the tooth bud structure with the wide open apical end might mislead one to the making of a diagnosis of the presence of an infection. However, Figure 2 pictures the difference between a periapical destruction in a developed tooth and the difference in appearance of a growing tooth, as shown in Figure 1.

In Figure 3 there is nicely pictured a newly erupted first bicuspid with a deciduous molar over the second bicuspid, the crown of which is fully developed but in which very little growth of the roots can be noted. Here it can be seen how closely the walls of the tooth bud follow the outline of the tooth crown. At such time that further development will take place, the formation of the roots and the increase of distance and space between the tooth crown and the bud wall will cause pressure on the roots from within and their absorption will begin to take place.

The eruption of teeth may be delayed because of several reasons, all of which can be pictured. Infection may have taken place in a deciduous tooth which was too long retained. Such infection might progress into the developing tooth underneath. Injury of several forms may derange the blood and nerve supply. A supernumerary tooth may be in the path of the erupting tooth and obstruct growth in the normal or proper direction.

Many varieties of malposition can be noted and to attempt to portray all, or even the more common types, would be almost impossible. All such cases are interesting, not alone because of the abnormality pictured, but also because of the wonderful results which follow an early diagnosis and the correction of the condition so as to relieve the erupting tooth of pressure in an unusual direction and to permit it to right itself. The continuation of the obstructing supernumerary tooth or process, hindering an erupting tooth.

causes a great variety of deformities and may be the exciting cause of tumor or cyst formation.

The manner in which nature took care of this supernumerary tooth in one case is clearly shown in Figure 4. The crowding of the teeth, occasioned by the presence of this unnatural body in the supernumerary tooth is clearly pictured in the position of the two central incisors and the relative positions of the central and lateral incisors on the left side of the picture, compared to those on the right side.

Figure 5 is a rather unusual view and picture of a tooth. The history is interesting and bears evidence of the lack of attention most often given to the teeth of young children. Patient R. B. was 19 years old when this picture was taken. The first molar here pictured was well filled with a large amalgam filling which had been put in some time before, the definite date the patient could not recall. Two things are evident from the picture: first, that neither root was ever fully developed (compare the root lengths of the first and second molars, also the degree of apical development pictured); second, that some process has caused absorption of the root ends and that there is a well defined circumscribed process about the distal root, which can be seen extends some distance up the side of the root. This proved to be an infection found at the time of operation.

The subject of deciduous and developing teeth is an important one to the roentgenologist, principally because most often all the conditions which arise can be pictured and through the understanding and interpretation of what is pictured much future trouble can be avoided by the timely correction of deformities.

A Theoretical Study of the Biophysical Action of the X-Ray in the Treatment of Malignant Neoplasms *

DONALD C. A. BUTTS.
Philadelphia

FOR the past few years the writer has devoted much time to the theoretical and experimental study of the biophysical and biochemical action of the radioactive agents and their electrical influence in the treatment of malignant and nonmalignant tumor formations. This work has necessarily progressed at a comparatively slow rate, due to the complexity of the study and to the close, scrupulous observations demanded by the experimental work of the problem. Although many points are to be determined, certain definite facts have apparently been established as the result of this work, leading to improved methods of application in the treatment of various pathologic conditions with gratifying clinical results.

For collateral clinical investigations I am greatly indebted to F. C. Benson, Jr., M. D., Director of the Radium Laboratory and Clinic of the Hahnemann Hospital in Philadelphia, who, through his valuable help, has made much of this research possible. The skill with which Dr. Benson has applied this working foundation in the treatment of many advanced cases of malignancy has brought about results previously believed to be impossible. However, such clinical results will be withheld until a later time, thereby allowing definite facts in this field to be accumulated and presented.

The outstanding points evolving from this extended investigation of the physical phenomena demonstrated by malignant cells and the antidotal physical action of certain rays from radium are as follows:

1. That for a cell to undergo alteration from normality to what we know as malignancy, three phases of disturbance in intracellular mechanism and metabolism must be brought to bear; the first, physical; the second, chemical; and the third or resultant, histological, such alterations when undergoing repair as the result of radiation assume the same order.

2. That the cells comprising carcinomata exist in a positive state of physical or electrical unbalance, as compared to normal cells comprising healthy bodily structures.

3. That our bodily cells may be regarded as minute storage batteries or electrochemical units, composed of positively and negatively charged portions in definite ratio and continually in active motion, which interchange; and through electrical impulses and molecular combinations, cell life and function is carried on, and in order that a body emitting certain rays and radiations may effect such intracellular reactions they must do so by means of the electrical influence conveyed by the emitted rays and radiations. Thus, if a ray bearing a certain and constant electrical charge is brought in contact with a cell existing in an electrically or physically opposite state, physical alteration would necessarily be brought about, and if the source of such rays and radiations is allowed to remain, and the rays exert their influence over an extended period of time, the second or chemical stage of transformation would through necessity follow and in due time give rise to histological change. Thus the process is reduced to one of complete alteration of intracellular molecular reaction and biochemical change. The former and latter of these alterations (physical and histological) have been demonstrated experimentally; the latter, histologic, has in addition been proved clinically; the second, or chemical, still awaits experimental proof. However, this alteration (chemical) is apparently supported clinically by the fact that patients undergoing treatment show a marked improvement in their general physical condition, probably due to readjustment of metabolism or "habit chemistry."

4. That the beta particles or rays, which are negative electrons, are the ones responsible for biologic cell change, and these, by neutralizing the excess potential within the tumor cells, bring about their desired and self-possessed therapeutic action by repeated small doses of screened radium, or radium emanation, rather than the large and continuous doses

*Received for publication June 16th, 1924.

heretofore employed. Hence neutralization of intracellular activities rather than cell destruction is our ultimate goal.

5. That the continued physically or electrically positive state of cellular reaction results in increased cellular activities and propagation, while on the other hand, an inhibition of cellular activities, and eventually, cell death, follows a continued negative state of physical unbalance within the cell. This has been demonstrated experimentally and clinically.

6. That the biologic action of gamma radiation is practically nil, and the noteworthy attribute in the treatment of malignant neoplasms is their penetrability and vehicle or excitant for secondary beta rays or negative electrons.

7. In all probability, the burning, ulceration and constitutional reactions developing as the result of long, continued and intense radiation is the result of the continued physical action of the primary or secondary beta rays, or negative electrons (compare with 5).

8. The nausea, vomiting, depression, etc., following large doses of radium are due to the absorption of the products of cell death by the entire organism.

9. Finally, that cancer, in its advanced stages is no longer a local condition, therefore not accessible to local treatment alone and in order to successfully treat and control dissemination we must be able to combat or neutralize the displaced cells from the original or primary growth with an agent or agents capable of exerting a similar physical or electrical action as those employed in the treatment of the primary and local condition; for such migrating cells must, within themselves, be endowed with the stimulating property and power responsible for the development of the original neoplasm, and therefore will only respond to similar physical or electrical combative agents.

These theoretical considerations and experimental findings having been determined, it becomes necessary to apply such a working basis to other methods of treatment which have been more or less successfully applied in combating such conditions as the one under consideration. This naturally brings us to the theoretical study of the roentgen rays as their action is, from the purely physical standpoint, more closely related to that of radium, the outstanding difference being in the source of the radiations liberated. In the case of the former, we are dealing with induced rays and radiations, existing only so long as the necessary current is supplied to the roentgen tube; while with the latter, such rays and radiations are emitted spontaneously and continuously throughout the life, or decay, of the element.

When we consider the ease with which an agent of the radioactive series gives up an electrically charged particle or ray, and in so doing becomes an entirely new element with altered physical and chemical properties from the one from which it was produced, we are forced to recognize the powerful effect such particles or rays must have upon the delicately balanced cells constituting our bodily structures. Such considerations are likewise applicable to the physical study of the x-rays and more especially those employed for therapeutic purposes where penetrability is the outstanding requirement.

Let us at this point formulate the physical comparison between the rays of radium and those of the roentgen tube.

1. The canal rays consist, under certain conditions, of positively

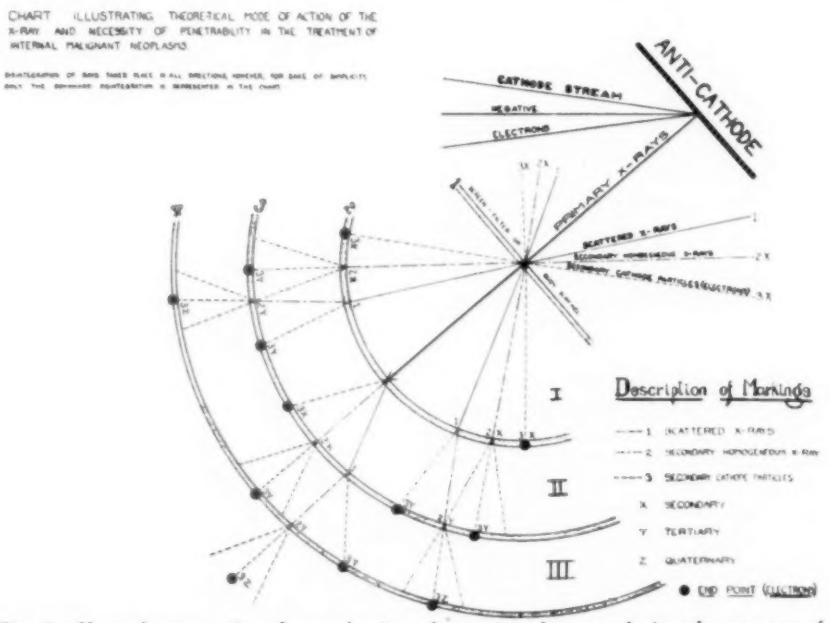


Fig. 1—Chart demonstrating the production of negative electrons during the passage of radium rays through the body.

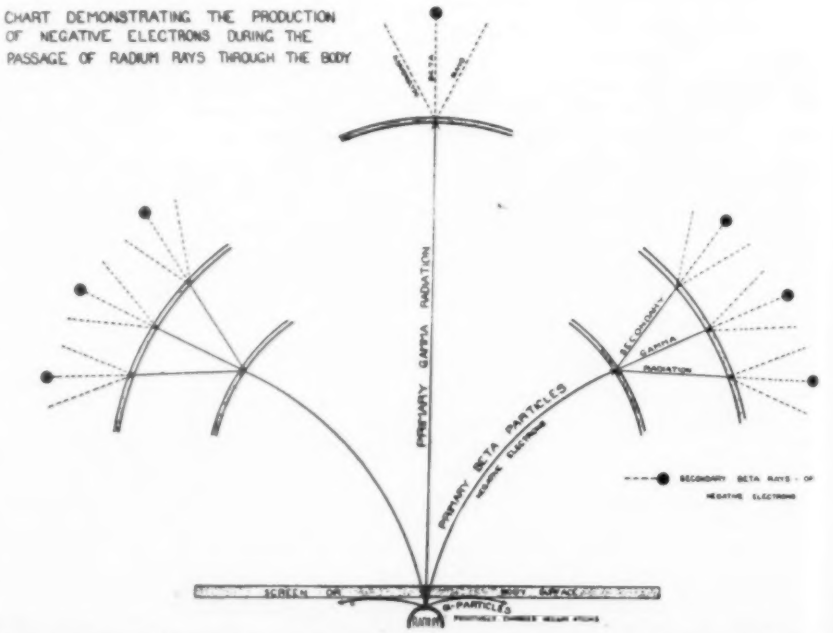


CHART DEMONSTRATING THE PRODUCTION OF NEGATIVE ELECTRONS DURING THE PASSAGE OF RADIUM RAYS THROUGH THE BODY
PRIMARY GAMMA RADIATION
PRIMARY BETA PARTICLES
SECONDARY GAMMA RADIATION
SECONDARY BETA RAYS OF NEGATIVE ELECTRONS
SCREEN
B-PARTICLES

Fig. 2—Chart illustrating theoretical mode of action of the x-ray and necessity of penetrability in the treatment of internal malignant neoplasms. Disintegration of rays takes place in all directions, however, for the sake of simplicity only the downward disintegration is represented in the chart.

charged helium atoms which are low velocity alpha particles.

2. The particles of the cathode stream are low velocity electrons; i. e., slow beta particles, or negative electrons.
3. The x-rays are, as far as is known, identical with gamma rays, of comparatively small penetrating power. From a theoretical study we have no more reason to believe them responsible for biologic cell change than are the gamma rays of radium.

Referring to Figure 1, it can be seen at a glance there are only two rays of radium (beta and gamma) which have a wave-length sufficient to penetrate any appreciable depth of tissue, and therefore to one or both of these might be assigned the property of bringing about biologic cell change. As the alpha particles have a wave-length of about 5 cms. (the greatest range being 8.6 cms., which is that of the alpha particles from Thorium C_2) they may be entirely disregarded as having any therapeutic action, as the thinnest walls of any container for radium application will readily eliminate their passage.

Again returning to Figure 1, we note that the emitted beta and gamma rays eventually give rise, as an end product, to secondary beta rays, or negative electrons, upon their passage through various depths of tissue, and herein, I believe, lies the true biologic action of radium in the treatment of malignant processes.

The neutralizing physical influence of the negative electrons has been demonstrated experimentally during this investigation, also the resultant histological change following comparatively small doses of radium emanation, where the great bulk of emitted radiation consisted of beta rays with a small percentage of gamma rays, while all of the alpha particles were completely screened out.

For a comparative theoretical study, Figure 2 was devised, for the purpose of demonstrating the subsequent physical action produced by the passage of a primary x-ray beam through various depths of tissue, as comparable to the passage of beta and gamma rays illustrated in Figure 1.

We all know that during the passage of roentgen rays through tissue, especially the more penetrating type, the rays are scattered diffusely and approximately equally in all directions, others being consumed or absorbed through their direct action on the tissue.

Reference to Figure 2 demonstrates the production of the primary beam and secondary radiations. In this hypothetical chart, we can see that starting with the surface tissue (the skin) and working inward, or in the case of the chart, downward, there are definite theoretical zones established, each of which is characterized by the creation of secondary, tertiary or quarternary cathode particles, as an endpoint of disintegration. Thus for each definite depth of tissue traversed we would have the scattering of secondary or tertiary radiations and the formation, as an endpoint of radiations scattered in the preceding zones, of a certain number of secondary, tertiary or quarternary cathode particles or negative electrons until a certain depth is reached and there are no longer radiations capable of the formation of negative electrons. Thus in each zone penetrated, we could expect biological cell change due to the action of the liberated electrons in that particular zone.

This action would naturally be most intense at the surface and gradually decrease in succeeding zones until the last zone, consisting entirely of cathode particles and incapable of exciting the production of further cathode particles is reached. This marks the end of the disintegration products, and biologic cell change; for it is due to the action of the negative electrons that cell change, first, physical; second, chemical; and third, histological, is brought about. Without the neutralizing negative influence of the electrons we cannot hope for a beneficial cellular change in the treatment of malignant processes.

It is not the intention of the writer to make this a lengthy and complex theoretical discussion, and the considerations presented are intended solely as a preliminary note.

Through the kindness and cooperation of J. W. Frank, M. D., Chief of the X-Ray Department of the Hahnemann Hospital, the experimental work on this theory will be started in the near future and every precaution will be taken to make this work as accurate as were the experiments on radium, the results of which were mentioned in the text. Should this work verify the theoretical deductions and results obtained in former investigations, we may hope for a more thorough understanding of the powerful physical influence of the agents now employed in combating the most dreaded of human maladies, and in so doing bring about results possessed within the physical structure of the atom, more especially, the *negative electrons*.

For adequate laboratory facilities I am much indebted to Mr. H. K. Mulford, President of the American Chemical Laboratories in Philadelphia, through whose kindness, sufficient space has been supplied and material furnished to enable the writer to carry on a great portion of this research.

CONCLUSIONS

1. Cells comprising malignant neoplasms exist in a positive state of physical or electrical unbalance, as compared to normal cell balance.
2. The influence of the radium rays in the treatment of neoplasms is formulated in the text.
3. The ultimate action of radium and that of x-rays is identical, i. e., in both cases the end result is the formation of negative electrons, either in the form of secondary beta rays from radium; or the secondary, tertiary, and quarternary cathode particles formed by the scattering of a primary x-ray beam.
4. Readjustment of intracellular balance rather than cell destruction is our ultimate goal. This may be accomplished by a more thorough understanding of the tremendous physical and inhibitory effects brought to bear upon intracellular activities by the negative electrons, possessed by the beta rays of radium, the cathode particles from the scattered x-ray beam, or by the electronegative colloids.

Diathermy in the Treatment of Pulmonary Tuberculosis *

DEAN W. HARMON, M. D.,
Ames, Iowa.

SOME ten years ago I knew tuberculosis. Fresh from the laboratory I could isolate the acid fast bacillus. Fresh from the wards I knew its clinical manifestations, its complications. Fresh from the autopsy room I knew its pathology, and fresh from the textbook, its orthodox treatment. What more could a practitioner-to-be want? This was ten years ago when as an intern I entered general practice, but what a sad awakening! The sharp edges of my medical cocksureness have since been rounded off by the bumps of death certificates signed "pulmonary tuberculosis." Now, I fear that dread disease but, in a small way, I believe I am beginning to learn something of its therapeutics. I have learned that you cannot snatch a mother from the midst of her family ties for a climatic cure and get one. You cannot tear the breadwinner away from his loved ones for sanitorium treatment and expect him to gain. Unfortunately, most of the victims of this scourge are obliged to follow some occupation for a livelihood and after repeated experiences I have concluded that any really successful treatment should be one that can be carried out with the patient in his usual environment, or if need be, while he is still following his employment.

Diathermy admirably answers this qualification. It is not the purpose of this paper to enter into the physics of diathermy, suffice to say it is a high frequency current of at least 500,000 alterations per second and permits the passage of a current without painful stimulation of the tissues, the resistance offered giving rise to heat production. By it we are able to heat any portion of the lung without a general congestion, in other words we are able to produce arterial hyperemia of any portion of the lung. Many workers have called attention to the fact that pulmonary tuberculosis and mitral heart lesions are not co-existent. The lungs engorged by pulmonary blood inhibit the tubercle bacillus as well as concomitant infections. With this in mind one can readily see one reason why diathermy exerts a beneficial effect in this disease. Not only do we produce an arterial hyperemia but also increased phagocytosis, a quickened metabolism, an elimination of toxins and increased osmotic processes. Undoubtedly the heat inhibits the tubercle bacillus and certainly it has been proved again and again by Stewart and others that the growth of pneumococci, staphylococci and streptococci is inhibited by diathermy.

In my practice I use heavily nickel-plated brass electrodes four to six inches in diameter, but block tin or the recently introduced mesh electrodes will do as well. I have found it impossible to satisfactorily employ a moist pad electrode. One cannot get an even administration of current nor control the field, and he may lose the confidence of his patient through a burn. In choosing electrodes one should have in mind where one wishes the major effect, if in the anterior half of the chest, in the apices, place the smaller anteriorly, or if in the postbronchial glands, then reverse the position. Never lose sight of the basic laws of diathermy, namely, "Density varies inversely as the area of the electrode, and the amount of heat formed varies as the square of the amperage." For instance, if one has two electrodes of three and six inches square, four times the heat will be generated under the smaller electrode. If the milliamperage is doubled, the heat effect will be quadrupled. However, in high milliamperage this is not entirely true as the body reflexes are then stimulated. Also diathermy always travels in straight lines, not necessarily the path of least resistance, therefore tissues having the highest resistance will generate the highest amount of heat. Electrodes should be well soaped for better contact and the upper electrode should be weighted down with a sandbag.

Treatment should be started gradually. I give 100 ma. current for five minutes and then increase to 600 to 800 ma. for one-half hour, gradually lengthening each sitting until 40 or 50 minute periods are reached. One should use what Sampson has so aptly described as a sedative technique, a slow gentle beginning, long treatments and high milliamperage daily for the first two weeks, then every other day, then bi-weekly, but results should not be spoiled by discontinuing treatments too soon.

Symptoms the first few days may be alarming. The temperature may rise, cough and expectoration increase, but all this is explained by the hyperemia induced and by the absorption of toxins. After the second week the expectoration will gradually lessen and then will cease, the temperature will fall to normal or a little subnormal, night sweats will cease, the cough will disappear, and the appetite improve and the weight will progressively improve.

In my series of 14 cases all were improved by treatment: five of them I pronounced cured and the balance are either under treatment at the present time or have passed from under my control. In every case there has been an improvement after the second week. Grover reports a similar experience as do several English writers. Naturally, the early cases will make the best progress, but several of my cases were well advanced.

A counterindication to diathermy, at least theoretically, is the danger from hemoptysis. The flushing of the diseased lung with arterial blood would tend to favor this. However, one of my patients had suffered his second severe hemorrhage at first examination, but proceeding with extreme caution for many weeks I secured an improvement with no return of hemorrhage. Grover mentioned several of his colleagues who had had similar experiences. In looking over the literature I was unable to find a single reported case of hemorrhage following diathermy, but it is well to keep this danger in mind. I would not advocate its use in a

*Read at a meeting of the Iowa X-Ray, Radium and Physiotherapy Society, Des Moines, Feb. 27, 1924.

nondraining tuberculous abscess, due to liability of bacterial and pus absorption with subsequent metastatic abscesses.

I submit the following case reports:

Case 1. White female, age 23. Family history is negative. Student nurse in training at Augustana Hospital, Chicago. Following influenza in 1918 she developed pulmonary tuberculosis. Diagnosis made by hospital staff. Sent to Ottawa tent colony. Became rapidly worse and was finally "sent home to die" as she expressed it. Her weight was 99 lbs., temperature 102, pulse 90, blood pressure 108 to 158, fine crepitant rales both apices front and back. She received 600 to 900 ma. daily for five weeks, then on alternate days for three weeks. She was discharged in 1920, weight 117, clinically cured, and she has remained well since. In this case I had the most hearty cooperation of the patient who faithfully followed my directions and also the dietary and hygienic ones given her at Ottawa.

Case 2. White female, age 48. A widow with five children. One sister and one niece died of tuberculosis. She complained of pain in the chest, weakness and loss of weight. Her weight was 117 lbs. Fine crepitant rales were heard in both apices, pleural friction rub in right lower lobe. X-ray showed a general fibrosis with marked calcification throughout both lungs and also an increase in density with mottling of the left apex. Diagnosis, pulmonary tuberculosis. She received routine treatments. Three months thereafter she weighed 138 lbs., had no afternoon temperature nor pain in the chest, her appetite was good. She was discharged in January, 1921, has remained well ever since and is doing her own work.

Case 3. White female, age 17. She is the daughter of patient in Case 2. Loss of appetite, weight 112 lbs., crepitant rales in the right upper front and the x-ray shows a density there. Diagnosis, early pulmonary tuberculosis. After two months treatment the patient weighs 118 lbs. and has shown no symptoms since 1921.

Case 4. White male laborer, age 26: Patient was first seen while suffering a severe hemorrhage of the lungs, the second within ten days. Crepitant rales in the right upper lobe with change of resonance. He was given 15 minute treatments with 300 ma. cautiously working up to 600 ma. for a period of six weeks. He gained weight and strength rapidly, his cough ceased and the pinkish tinge gradually faded from the sputum. There has been no return of symptoms since his discharge two years ago.

In presenting these case reports I would not have you believe that diathermy is a specific for tuberculosis. However, I do believe that if used properly in combination with dietary measures, fresh air, and sunshine, rest and ease of mind, one can hold out to patients the hope of a certain measure of relief and a reasonable chance of cure. My creed in medical practice sets forth that there is no place for the cultist who with narrow vision practices only one unit of therapy without regard for the merits of all others. Every graduate in medicine worthy of his calling will keep an open mind and will investigate the worth of all methods of treatment and will give his patient the benefit of the best the whole field affords in his case. Certainly this method merits a fair trial when we are told that ten per cent of the deaths in the United States from all causes are due to tuberculosis. Are not our patients entitled to something better than they have been getting? Fellow practitioners, I commend diathermy to your investigation in this field, with the faith that you will recognize its merits and realize its limitations.

REFERENCES

Hall, P.: Diathermy in the treatment of pulmonary tuberculosis. Practitioner, 109:328, October, 1922.

Hirsch, A. B.: Diathermy an aid in empyema. Medical Record, 98: 1015, December, 1920.

Grover, B. B.: *Handbook of Electrotherapy*, also *High Frequency Currents*, Electron Press, Kansas City, Mo.

Sampson, C. M.: *Physiotherapy Technic*, C. V. Mosby Co., St. Louis, Mo.

Stewart, H. E.: *Diathermy and Its Application in Pneumonia*, Paul Hoeber, Inc., New York City.

Treatment of Hypertrophied Tonsils With X-Ray *

W. L. PINDELL, M. D.,
Winterset, Iowa.

THE treatment of tonsils by the x-ray has probably been discussed and cussed more than any other subject in roentgen ray therapy. My subject as announced is the treatment of hypertrophied tonsils and right away you are wondering just what I mean by hypertrophied tonsils whether I mean large infected tonsils or large noninfected tonsils. To that I say both, for my results have been good with both; as good results as found in treating cervical glands, fibroids, eczema and ringworm.

I wish, however, to make it plain that I do not treat tonsils indiscriminately, and probably that partially accounts for the good results obtained. But I do venture to assert that practically all diseased tonsils can be benefited by the x-ray. If such men as Witherbee Lane, Williams Evans Israel, Trinder, Cunningham Van Allen, Sailan, Craig, Husey and Copeland recommend the treatment, I do not think that we should be afraid to carry it out. I am not opposed to the surgical removal of tonsils, for I know that there are some tonsils that cannot be taken care of in any other way, but I do think that a great many can be taken care of by x-ray without the patients being subjected to shock and the possible complication of a tonsillectomy.

I know the position of the eye, ear, nose and throat specialist and I also know the position of the radiologist who depends entirely upon referred work. They will knock, as a matter of course. Such is the life of competition. How are we to keep from being classified as quacks? I will tell you in one word—"Results." Try to keep up with the times by

*Read at a meeting of the Iowa Radium X-Ray and Physiotherapy Society, Des Moines, Feb. 27, 1924.

reading good journals, attending good meetings, belonging to the best medical societies and attending them. In my town we have nine physicians, two osteopaths, two chiropractors and one spiritualist. None of us is a specialist, so you see each of us may do as he pleases, and I am pleased to treat a few tonsils. At the time Witherbee came out with the treatment of tonsils by x-ray, I had only a six inch machine, but I proceeded to treat tonsils and I had the opportunity to treat a number, for at that time I was removing a great many surgically. The result of those treated by my old six inch machine is still standing at 100 per cent, and the most of those old cases were bad ones, the patients being subject to quinsy, chronic sore throat, repeated attacks of acute follicular tonsillitis, chronic follicular tonsillitis, and with submerged and infected tonsils. To date these patients have had no further trouble. Now if such tonsils as these can be successfully treated why not pick out and treat the ones you know will yield good results? That is what I am doing today.

My treatments are based on the conclusions of Witherbee and other pioneers in the field. My technique is a 10 inch spark gap; 10 inch distance; 1 mm. Al, ½ mm. Cu and a piece of sole leather as filter; time 4 min. Treatments are given weekly until fifteen minutes are given, then once every two weeks. The average number of treatments is from eight to ten. With this filtration one can obtain a diagnostic plate of the elbow joint within five seconds, so this proves that it gives proper radiation. I have had no burns and but little tanning with this technique.

Within the past twelve months I have treated 77 cases with satisfactory results in all of them with the exception of four cases, two of which I should not have treated.

Case No. 1: Man, 45 years old, easy tonsils, extremely neurotic, gave up x-ray treatment and went to a throat specialist who had advised him that x-ray was dangerous.

Case No. 2: An old man. Refused operation. Tonsils large and infected with very large anterior and posterior cervical glands. Chronic sore throat. This case is still under observation, but his tonsils are shrunken to about one-half their former size and the glands to about one-third the former size and he has soreness only occasionally.

Case No. 3: Child, five years old. Received light treatment and results were seemingly good, but three weeks after the last treatment she developed a severe cold or grip which was followed by enlargement of the posterior cervical glands. This patient lived twenty miles away. She was taken to a hospital where her tonsils were removed. She probably would have gotten along all right without this, for the home doctor reported that the tonsils looked all right.

Case No. 4: Male, 18 years old. The patient had very large tonsils which were said to be always sore. After the third treatment there was no longer any soreness, but I was unable to reduce the tonsils more than one-third after 12 treatments. However, the patient is pleased.

My friend Joseph Peden, radiologist to the St. John's Hospital in St. Louis, tells me that he believes the shrinkage of the tonsils by x-ray seals up the infected material within the tonsil. Such is not the case, but what actually takes place is this: The x-rays cause the tonsil to shrink through destruction of the embryonic lymphoblastic root cells to which the prolonged growth of lymphoid tissue is due. As the follicles undergo shrinkage the crypts inevitably become more shallow and their apertures widen and become averted until at last they are completely obliterated and instead of crypts there remain only depressions in the tonsil which becomes smaller smoother, paler, cleaner, with no exduate present on deep pressure nor does the tonsil contain any hemolytic streptococci.

According to Ira Denman of Chicago, tonsils can be treated with good results by using condensed, water cooled ultraviolet rays for sterilization, and diffuse ultraviolet rays to promote metabolic reaction against infection, this followed by x-rays to produce shrinkage.

Conclusions: All large tonsils enlarged lymphoid tissues whether adenoids or situated behind the pillars or occluding the eustachian tubes and causing deafness and all chronic sore throats not amenable to ordinary treatments can be greatly benefited by the x-ray judiciously used.

Superficial Malignancies.*

C. D. BOTHWELL, M. D.,
Oelwein, Iowa.

THE fact that a malignancy is small or superficial does not render it any less malignant. Since the beginning of time these processes have been known and treated and yet today we have recurrences just as there have always been, although the percentage of cures is now greater.

These malignancies have been treated by surgery, by x-ray, by radium and by a combination of methods, by pastes and by whatnot, and some cures have always come about through each method. The use of an escharotic paste, although it must be recognized as a good treatment at the time it was originated, is now absolutely to be condemned and its use should be considered criminal. There has been surgery in the past without any thought or at least consideration of x-ray treatment, yet there are a certain number of clinical cures to be attributed to surgery. However, at the present time there are many surgeons who are willing to turn these malignancies over to the radiologist.

X-ray has gone through a long and gradual development. In the early days treatment was given practically daily without any filter and with tubes that were erratic and impossible to control. Then, as apparatus and technique improved, more or less filtration has been employed and harder rays available. Treatment has been effective with both hard and soft rays and there are roentgenologists who treat the same mass with both hard and soft rays, beginning with no filter and gradually

*Read at a meeting of the Iowa Radium, X-Ray and Physiotherapy Society, Des Moines, Iowa, Feb. 27, 1924.

adding filter as treatment is continued.

Radium is curing a certain percentage of cases but its results are not always satisfactory, although no single method of treatment can show better results.

Electrocoagulation of malignancies and nonmalignancies has of late been gaining in favor and there are very good and scientific reasons why this should be so. Malignant cells are destroyed by a heat that will not damage normal tissue, therefore the application of heat to malignant tissue is an advantage. In coagulation we have a method of removing tissue neatly and completely, far more completely than can be done by the most expert artisan with a scalpel; a method which can destroy cancerous growths that have invaded bone or cartilage and that does not leave a way for extension through the lymphatics and which is capable of the finest control conceivable and with which the heaviest kind of treatment may be given; a method which is not followed by hemorrhage or infection and which may be used with ease and certainty and flexibility in areas formerly thought inaccessible.

Certainly electrocoagulation opens up a field of wonderful possibilities and remarkable results may be looked for in the future from the use of this method. The possibility of scars and deformities remaining after treatment has sometimes influenced the physician in his choice of treatment, but the cosmetic end should be necessarily secondary. A fine cosmetic result is desirable and commendable, but the first concern is the obliteration of the tumor mass. Electrocoagulation has often removed the ugliest and most disfiguring growths with a cosmetic result nothing less than marvelous.

Any single method of treatment may be expected to produce a clinical cure, according to the skill and thoroughness with which it is applied and here is one thing to be noted, namely, that a cancer, the treatment of which stops short of a cure, is a cancer stimulated, and we must also remember that until the percentage of cures reaches the 100 mark we have fallen short of perfection.

We know that malignant cells are destroyed and sickened by the x-ray and we here agree that any carcinoma that is removed by surgery should have that operation both preceded and followed by radiation. We agree that if a breast is to be amputated, the order should be radiation, operation, radiation, and there are many surgeons who think as we do and are glad to have us cooperate with them. If this is common sense in big things, why should it not be applied to what seems a little thing but which is far from being so? If elaborate technique is necessary in a breast cancer, why should a cancer on the face be thought to be trivial merely because we can put our hand on it? In the light of our present knowledge, why should not the following be as nearly perfect treatment as the methods at our disposal will allow?: (1) Heavy, filtered, x-ray treatment which will destroy some cancer cells and make the others sick. (2) Complete eradiacation of the tumor mass by electrocoagulation. (3) X-ray treatment to push under any malignant cells coming up for the last time.

Physiotherapy in the Hospital *

E. C. HENRY, M. D.,
Omaha.

PHYSIOTHERAPY is an old friend in a new dress. Ideas are subjected to the laws of evolution, the same as plants and animals. The master thinkers in medicine have always recognized that the human body is subject to law and have given their best thought to unveiling those proximate principles.

John Hunter was a prince in the eyes of the scientific surgeon, a babbler to the cutters. He probably devoted more time and thought to the question of muscle and motion than any other subject. He developed a vocabulary that went over the heads of his colleagues and only today are we beginning to grasp his meaning.

The riddle of the universe is motion. The key to this riddle is the electron. When we know the law of the electron, there will be no mystery.

---

*Read at a meeting of the Iowa X Ray, Radium and Physiotherapy Society, Des Moines, Feb. 27, 1924.

Physiotherapy is as old as medicine, but by evolution, war and science, it has come to occupy a commanding position in the world of thought. The x-ray, radium, iodide of potash, mercury and quinine are physiotherapy.

Scientific medicine is a grand pipe-organ with 64 octaves on which we play with more or less skill. The spectrum will tell us whether we are playing with octaves in the infrared or the radium rays. Let not the old stand-patter expose his ignorance by shrugging his shoulders and saying he does not believe in physiotherapy, for he has been using it all these years with every dose of medicine, every poultice or bath he has given.

The World War with its human wreckage caused medicine to study anew the anatomy and physiology of joints, nerves and muscles. It is with the thought of laying some of these facts before you that I present this paper today.

Early in the war, say 1914-1915, England realized that her great problem was going to be how to restore the hundreds of thousands of wounded men coming back from the trenches.

In order to change a wounded man from a liability to an asset, he must be transformed from a helpless cripple to a self-supporting producer and each case presented a different problem for solution.

America did not get into the war in time to accumulate a vast army of cripples, but another department of medicine has arisen which corresponds very closely; namely, industrial surgery.

Do we realize that our modern industrial system is furnishing our hospitals and dispensaries approximately 200,000 patients a year and the same methods that applied to the soldier, apply to the civilian? The English set out to solve their problem by reviewing the anatomy and physiology of joints and muscles as taught by their masters, Hunter, Hilton, Goodsir and Hall. They were surprised and embarrassed to find

how many things these masters had taught and modern surgeons had overlooked.

With our instruments of precision it is amazing how much we can check up and find absolutely accurate.

Take, for example, the physiology of muscle. John Hunter pondered for years and years on the question of how a muscle worked. He kept talking about minimal load. What did he mean? Is it of any importance to us to know about the mechanics on which muscles work?

Here are some simple facts that we would do well to meditate on. Muscles constitute about 45 per cent of the entire body. Muscle is the most elusive, least understood, most sensitive tissue of all. It is one of two tissues of the body that cannot reproduce itself. Most of the metabolic changes take place here. The outflow of nerve currents is transformed from nerve currents to motion—the only method by which a human being can express himself—in this tissue. There are more than four hundred sets of muscles in the body, all working in groups—none acting singly. With the exception of the brain, the muscles are the only tissue of the body capable of being educated. Muscles, like people, can be coaxed to do almost anything. They are most rebellious when driven.

If you desire to lay a foundation on which you can build a worth while structure for practice, may I suggest two books that I found very helpful? In 1917-1918, Sir Arthur Keith delivered a series of lectures at the Royal College of Surgeons. Later they were published in book form under the caption, "Menders of the Maimed." This book changed many of the methods then in vogue in handling the wounded. The other book was by W. C. MacKenzie, entitled, "The Action of Muscles." A careful study of these two books alone will give you an entirely different conception of the use and abuse of massage, electricity, light and motion.

Modern medicine cannot be practiced without x-ray, radium, light and heat. These modalities are essential in an up-to-date hospital. Physicians are making a fatal mistake in not equipping their offices with such apparatus as their locality needs, rather than letting these useful instruments be monopolized by the charlatans and quacks.

EDITORIAL

The JOURNAL OF RADIOLOGY

A Journal of Ideas and Ideals.

Subscriptions—In the United States, its possessions and Mexico, $5.00 yearly: Canada, $5.50: elsewhere, $6.50 the year.

Advertising rates on application. All advertising must conform to American Medical Association Rules.

Payments for subscriptions and advertising must be made to Radiological Publishing Co., in New York or Chicago Exchange.

Address all communications to Business Office, 121 South Thirty-third Street, Omaha, Nebraska.

Published monthly at Omaha, Nebraska, by the Radiological Publishing Company.

A. F. TYLER, M. D.,
Managing Editor

ANNUAL MEETING

American College of Radiology and Physiotherapy

Chicago

November 10, 11, 12, 13, 14.

Hotel Sherman

Third Annual Meeting.

THE third annual meeting of the American College of Radiology and Physiotherapy will be held at Hotel Sherman Chicago. November 10th to 14th. Indications point to an attendance of one thousand physicians and an excellent program is being prepared. Already many of the leaders in x-ray and radium work and in physical therapy have sent in the titles of their papers. Clinics have been arranged at the Chicago hospitals.

A tentative program will appear in the October Journal. Come spend a few days in postgraduate work and in getting better acquainted with the leaders in physical methods in medicine.

The Twenty-Fifth Anniversary of the Discovery of Radium.

This anniversary was celebrated in Paris on December 26th 1923, upon the initiation of the Curie Foundation. The Foundation had functioned for some time previous to this but the formal inauguration was delayed until this time.

The principal ceremony took place at the Sorbonne and was presided over by President Millerand. All of the intellectual elite of France and many distinguished guests from other countries were present. America was represented by Dr. Gendreau of the University of Montreal, Dr. G. Failla of the Memorial Hospital, New York City, and Professor Noyes of the American Chemical Society. Dr. Failla has written a most interesting account which appeared in the July issue of *Radium* from which the data for this article was gleaned. He says in part:

"Since the Curie Foundation is practically unknown in this country it is perhaps as well to give a brief outline of its historical development. In 1922 the University of Paris and the Pasteur Institute in close cooperation founded the Radium Institute. In the years 1912-1914 two modern laboratories were built, to be devoted separately to chemical and physical researches and to biological studies of radiation. The former is an intrinsic part of the University of Paris and is directed by Madame Curie. The latter bears an analogous relation to the Pasteur Institute and is under the directorship of Dr. Claude Regaud. The war came before the laboratories were even fully equipped and their work came to a standstill until the end of 1918. In time, however, the work was taken up with renewed zeal and rapid progress has been made.

"Since the Pasteur Pavillion is devoted to purely scientific investigations the need soon arose for a suitable place in proximity to the laboratory where patients could be treated properly. It was to supply this need that the Curie Foundation came into existence. It is a private organization which has undertaken to supply means to the Radium Institute for scientific research, and particularly for the therapeutic applications of radium and x-rays. The foundation was recognized of public utility by official decree in May 1921, and has since enjoyed the support of the government.

"The president of the Board of Directors is M. Appell, Rector of the University of Paris; the vice-presidents are Dr. Roux, Director of the Pasteur Institute, and Madame Curie; the treasurer is Dr. Henry de Rothschild, one of the founders; the secretary is Dr. Regaud, Director of the Laboratory of Radiophysiology of the Radium Institute."

It is gratifying to learn that shortly previous to this celebration the French Parliment granted Madame Curie an annuity of 40,000 francs.

The American Radium Society.

At its last meeting this society elected to honorary membership Professor Sir Ernest Rutherford of Cambridge University, England, and Dr. James Ewing of the Memorial Hospital and Cornell Medical School, New York City. Dr. Claude Regaud and Madame Curie of Paris. Dr. Francis Henry Williams of Boston, Dr. Howard Kelly, Baltimore, and Dr. Robert Abbe of New York City are also honorary members.

The meeting held this year is said to have been the most successful of any in the history of this organization. Dr. W. S. Newcomet of Philadelphia succeeded to the presidency this year and the following officers were elected:

Douglas Quick, M. D., New York City, President-Elect.

Albert Soiland, M. D., Los Angeles, First Vice-President.

E. C. Samuels, M. D., New Orleans, Second Vice-President.

Edwin C. Ernst, M. D., St. Louis, Secretary.

Robert E. Loucks, M. D., Detroit, Treasurer.

James T. Case, Battle Creek, Member of Executive Committee.

Leaders See the Light.

The leaders of some of the medical educational institutions of America are seeing the light. The Harvard School of Medicine has announced a graduate course in physiotherapy. Jefferson Medical College of Philadelphia was a pioneer in giving medical therapeutics a place in the undergraduate course. Stanford Medical College of California announces that physical therapeutics is to occupy a regular place as a part of the third year work of the undergraduate. * * * The people are demanding osteopathy, mechanotherapy, electrotherapy, phototherapy and other natural drugless methods. Medical schools must give courses in these methods. When they do that there will be no need of cultists.

From the Jour. Am. Asso. Medico-Physical Research.

The Institute of Experimental Medicine in Buenos Aires.

A new addition has been added to the Institute in the way of a building given in memory of Emilio J. Costa after whom the new wing has been named, the *Pavillion Emilio J. Costa.*

The increased facilities make possible an even more intensive program of cancer research than the Institute has heretofore conducted. The efforts of all research workers are to be brought to a focus here in clinical as well as laboratory study. Biologists, chemists, physicians, surgeons, pathologists and radiologists are to unite their efforts in working toward a solution of the cancer problem.

Medical Degree for Dentists in France.

A special communication to the *Review of Clinical Stomatology* from the secretary of the Association Francaise des Chirurgiene informs him that at a general meeting of that society held on March 30th of this year at the Faculty of Medicine of Paris, the members expressed their conviction of the need of a new statute introducing the requirement of the M. D. degree for all those who are intending to practice dentistry in France. They rejected the idea of the degree of Doctor of Dental Surgery as sufficient qualification. The society expresses confidence that its Administrative Council will continue energetically in efforts to accomplish this end.

Dr. Ernest Harnack Is Honored.

This pioneer radiologist of the London Hospital was honored June 4th by a gift from the Carnegie Hero Fund of a framed gift and a monetary gift of seventy-five pounds yearly. The hospital had previously granted him an annuity of 285 pounds in recognition of his services. Dr. Harnack like Dr. Charles Vaillant of Paris lost both his arms as a result of the roentgenological injuries which he received in the early days before the necessity for protective measures was understood.

Another radiologist, Doctor Barrois of Toulon, France, recently died a victim of x-rays. In spite of his handicap he did valiant service during the war and two petitions had recently been sent to the Minister of the Interior and Health asking that the Cross of the Legion of Honor be conferred upon him. Doctor Barrois should have had many useful years left to him, for he was but fifty years of age. However, his name is written in the scroll of those who have lived and died for a great purpose and this counts for more than length of life.

A New Chair at Jefferson Medical College.

In recognition of the far reaching developments of bronchoscopy in the diagnosis and treatment of diseases of the lungs and of esophagoscopy and gastroscopy in the diagnosis and treatment of diseases of the esophagus and stomach, the Board of Trustees and Faculty of the Jefferson Medical College have created a new chair to be known as the Department of Bronchoscopy and Esophagoscopy. Dr. Chevalier Jackson, formerly Professor of Laryngology in Jefferson Medical College, has been elected to the professorship of the new department. Dr. Fielding O. Lewis has been elected to fill the Chair of Laryngology vacated by Doctor Jackson.

ABSTRACTS and REVIEWS

Filming Internal Organs. Paris Letter. Med. J. & Rec. 119:621, June 18, 1924.

LOMON and Comandon, well known French scientific workers have invented an apparatus by which the internal organs of a living being can be cinematographed and studied in film projections. The apparatus is not yet on the market as there are still some minor details to be perfected but it will be in use before very long. The work on this apparatus was done in the physical laboratory of the Faculty of Medicine in Paris a cinematographic camera being used in conjunction with x-rays. Pictures of the heart can be taken at the rate of 17 images per second.

The Fundamental Requirements of An Efficient Roentgen Ray Service in Hospitals. JAMES T. CASE, M. D. Jour. A. M. A. 82:2071-2073 June 21, 1924.

THE author discusses his subject under the headings of equipment, organization technical help, interpretation of findings and records.

Equipment must be more or less complete according to the service expected and he discusses each detail of equipment including floor space. No amount of luxurious equipment will make up for the lack of a competent roentgenologist who is first a physician. There needs to be a standard of training established for technicians who of course are not to attempt interpretation. Even the average physician is not well fitted to undertake interpretation. Records of cases should be kept in writing and furnished in triplicate, one for the physician, one for the hospital and one for the roentgen ray department.

Every department of the hospital should participate in discussions of the roentgenologic work at staff meetings.

Report of the Radium Institute, London, for the Year 1923. A. E. HAYWARD PINCH, F. R. C. S., Medical Superintendent. British J. Radiol., 29:186-191, May, 1924.

DURING the year, 6,951 treatments were given. In most cases receiving a prolonged course of gamma rays the total exposure is divided into four periods of two applications of six hours begun in the morning and two of nine hours given in the evening, the total of 30 hours being thus given within two days. If tubes are buried they are allowed to remain for the whole exposure. The services of the surgeon are being requisitioned more and more frequently in burying these tubes.

Diathermy and radium have been used with good success in cases of carcinoma of the mouth and fauces, the primary growth being removed by diathermy, the associated glands excised and radiation of the whole area then employed.

The general trend of treatment is toward increased dosage; from 250 to 750 mgs. of radium element are used with a screen of 2 mm. lead for from 20 to 30 hours quite frequently. The systemic disturbance does not seem great and disappears under appropriate treatment, except when radiation has been applied to the abdominal cavity.

The term "radon" is used by the author to denote radium emanation.

The report is devoted to a consideration of radium therapy in diseases of the thyroid, thymus, spleen and lymphatic system. Flat surface applications are chiefly used, a large number of these being required, with screens of 1.5 mm. or 2 mm. lead. When radium is buried in the growth a screen of 1 mm. of silver is usually used but when numerous tubes are called for, 0.3 mm. platinum is preferable.

Human Cancer in Relation to Heredity. H. GIDEON WELLS, M. D., Radiology, 2:60-68, July, 1924.

STATISTICS of human cancer are not reliable for scientific purposes for many reasons set forth in this paper. Neither is much to be learned from transplantation of tumors from one animal to another for the transplanted tumor is merely a culture and the animal the medium.

The Mendelian law has been proved applicable to all plants and to animals from mammals to insects and there is no good reason to doubt that it is applicable to the human animal as well. It is a longer step from a pea to a mouse than from a mouse to a man and reasoning from spontaneous tumors in mice, the reasoning based on the Mendelian law, has given birth to certain conclusions by Maud Slye, which conclusions the author of this paper agrees with and supports by argument based on the observations of family histories.

Tumors in animals are the same in pathology as when found in man according to well grounded proofs which have been offered. The observations so often made that animals seem less subject to cancer than does man can be explained by the fact that few animals reach an old age, for an animal, and cancer is a disease of age and not of youth.

The author devoted considerable space in this article to the review of Slye's work.

Cancer is the result of two factors, stimulation and heredity, and heredity is the more important, the bigger that factor the smaller the other one need be for cancer to develop.

"Human beings are a mixture of heterozygotes in respect to resistance to cancer. If the tendency to cancer were a dominant feature, everybody would have cancer * * *if you have a big proportion of heterozygous and dominant mating which would seem to be the condition in the human species, what is bound to happen is that a small proportion will have cancer when the recessives crop out, perhaps one or two cases in a generation. Occasionally when two recessives mate, you will get a pure strain of recessives and then you have your cancer family." If the father dies of cancer and the mother neither has cancer nor any history of it in her family she is probably dominant and their offspring are heterozygous and will not develop cancer, but they will be capable of transmitting the tendency to their offspring. If a woman's mother and grandmother have

died of cancer but her father's family had no cancer in it, then she will be free from cancer and so will her children be, providing her husband's family has had no cancer in it. On the other hand, if her husband's family shows a history of cancer, her children may have cancer. In other words, there is no need to be depressed over the theory of cancer being heritable, on the other hand, there is much about it that is encouraging.

The author concludes by saying that all the evidence he can secure from both human and experimental material supports the theory of heritability.

Report of the Cancer Committee of the Maine Medical Association for 1923-1924. Maine Medical Jour. 14:235-236, June, 1924.

FOR three years the Maine Medical Association and the Maine Public Health Association have been carrying on an educational campaign along the lines of early diagnosis, proper attention to and treatment of precancerous conditions.

This year an entirely new standard lecture was prepared and the greater effort was directed toward the rural districts not heretofore reached.

The committee feels that there is need of further educational effort directed toward the medical profession and recommends that not only should the work be carried on among the lay public but among physicians themselves. They believe that this can best be done by engaging out-of-state speakers and holding cancer clinics whenever and wherever possible.

They recommend for perusal the new handbook on cancer issued lately by the American Society for the Control of Cancer. The price is only eighteen cents for the cloth bound copy.

They recommend the following program for the coming year: (1) Paper by a recognized out-of-state authority at the annual meeting. (2) Papers before every county medical society by some leading man in another county or out of the state. (3) A prepared paper on fundamentals by the Cancer Committee for use at cancer meetings and other public health meetings. (4) Distribution of the aforementioned handbook on cancer to the profession. (5) Cancer clinics in all the larger hospitals and centers of the state, possibly in connection with county society meetings. (6) Particular attention to lectures to nurses in all public and private hospitals, also to the public health nurse. (7) Short papers or talks on cancer worked in at other public health gatherings. (8) Continuance of lay program as carried out in previous years.

A Case of Congenital Right-Sided Diaphragmatic Hernia. REGINALD A. MORRELL, M. R. C. S., L. R. C. P., British J. Radiol. 29:171-174, May, 1924.

THIS paper reports a case of congenital right hernia in a woman 57 years of age. There were no symptoms pointing to such a condition. There was a lateral deviation of the spine and a complaint of discomfort and dragging under the left costal margin. The hernial mass was discovered by x-ray and when seen in profile it can be differentiated into (1) the terminal portion of the ileum; (2) the cecum; (3) the ascending colon; (4) about the first quarter of the transverse colon. The latter descends through the diaphragm into the right hypochondriac region and even 20 hours after the meal no further details were available.

The Roentgenologic Diagnosis of Diaphragmatic Hernia, With a Report of Seventeen Cases. RUSSELL D. CARMAN, M. D., and SOLOMON FINEMAN, M. D., Radiology, 2:21-45. July, 1924.

THE authors report 17 cases of this lesion studied roentgenographically at the Mayo Clinic. The incidence has been about one in 18,000 patients examined.

As a rule the roentgenological demonstration of this lesion is not difficult. Occasional failures may be explained on the basis of five factors: (1) that the hernia develops as a late sequel to paradiaphragmatic purulent processes; (b) that it results from trauma or lacerations of the diaphragm months after the injury; (c) that spontaneous temporary reductions may occur; (d) that only one of a double hernia may be demonstrated roentgenologically; (e) that the opaque medium may not pass through the diaphragmatic opening because of strangulation or because of the patient's position during the examination.

Solid viscera may form the hernial contents and in such cases the oral or rectal administration of a barium suspension cannot reveal the presence of a diaphragmatic hernia.

It may be possible to demonstrate hernia of the kidney with the aid of pyelography.

While the roentgenologic diagnosis of diaphragmatic hernia is as a rule, simple and conclusive it is not infallible.

After administration of an opaque medium, diaphragmatic hernia must be distinguished from mechanical elevation and true eventration of the diaphragm, hourglass stomach, and esophageal diverticula.

The length of the esophagus should be determined roentgenologically. One of the cases reported was in all probability of the so-called congenital short esophagus type and such cases cannot be reduced surgically.

Roentgenological studies of the thorax are commonly made in cases of diaphragmatic hernia, because the symptoms are often referable to the chest.

Roentgenograms of the chest may exhibit fair evidence of the presence of abdominal viscera within the chest. In some instances such evidence may be extremely slight, and consequently the hernia may be mistaken for one of a number of conditions commonly seen in the chest. A series of roentgenograms is presented illustrating such similarity.

Pneumoperitoneum may be an aid in the diagnosis and differentiation of diaphragmatic hernia.

In all cases an endeavor should be made to ascertain the exact site of the hernial opening. The determination of this point is of importance to the surgeon in his choice of operative approach.

Cooperation between clinician and roentgenologist is necessary for the best results.

Physiotherapy in Orthopedics. RICHARD KOVACS. M. D., Jour. A. M. A. 83:99-103, July 12, 1924.

MANY medical and surgical conditions can be permanently relieved or at the least benefited by appropriate physical therapeutics and the regular practitioner has only himself to blame if refusing to give this relief to his patient, the patient betakes himself to an irregular practitioner.

The War, however, did much to convince the regular practitioner of the value of physiotherapy and the insurance companies and organized industry are doing much to keep its value before the public and the profession.

The thermic agents are classified as radiant light and heat superheated air, whirlpool baths and diathermy. The mechanical agents are massage and mechanical vibration. The indications for these agents are discussed together with those for manipulation and exercise.

The nature and effects of static wave, faradic, galvanic and sinus-

oidal currents are discussed. Ionization is recommended for scar tissue and ultraviolet treatment for diseases of the bones and infection of the sinuses.

A number of case reports are submitted.

In conclusion the author says that it is desirable that physiotherapy methods should be employed and studied on a much larger scale than they are at present and that all physical agents should be utilized and should be administered by a specially trained medical man. They will be most effective when combined with recognized medical, surgical and orthopedic treatment.

Cranial Radiography. ROBERT KNOX, M. D., British J. Radiol., 29:158-170, May, 1924.

DR. KNOX gave the technique for the examination of the sphenoidal sinuses in the March number of the British Journal of Radiology. This article is a continuation of the series and gives the technique for examining the maxillary sinuses. It discusses the various positions and angles their advantages and disadvantages. These articles are very complete and well illustrated and the copy of the journal containing them can doubtless be secured from the publisher, either 20 Bedford St., W. C. 2 London, or 67-69 East 59th St., New York City.

Modern Treatment of Tuberculosis of the Bones and Joints. G. R. GIRDLESTONE, F. R. C. S., J. Bone & Joint Surg., 6:519-537, July, 1924.

A NUMBER of pages are given to the discussion of heliotherapy used in these lesions. The author lays great stress on the fact that sun treatment must be combined with open air. The strong rays of the sun unchecked by cool and moving air effect a general loss of tone. The first step in heliotherapy is carefully graduated exposure of the body to develop pigmentation which is merely a protection to the skin and the deeper layers of tissue and is not a sign of health necessarily. Sun warms steadily, wind cools variably and the combination of the two is necessary.

A Case of Multiple Bone Lesions of Atypical Roentgenographic Appearance With the Pathologic Findings. CHARLES L. BROWN, M. D. and DANIEL M. STIEFEL, M. D., J. Bone & Joint Surg., 6:550-563, July, 1924.

A CASE of multiple tuberculous osteomyelitis with both formative and destructive lesions is reported. The case illustrates the difficulty of differentiating roentgenographically between pyogenic osteomyelitis, tuberculosis and syphilis and it offers an opportunity of correlating definite pathological findings with an atypical radiographic appearance for it showed both destructive and formative types of bone lesions, but was proved to be a tuberculous case. This case is a predominately formative reaction in tuberculosis of the bone, a pathology which shows little tendency as a rule to new bone formation, unless occasionally in the joints.

Dermatology and Radiology. ARTHUR U. DESJARDINS, M. D., Urologic and Cutaneous Rev., 28:383-389, July, 1924.

IN COMPETENT hands roentgen rays and radium will yield astonishing results in many skin lesions. Many dermatologists do not know this and what is more surprising, many radiologists do not take the trouble to qualify themselves for this work which explains perhaps why some dermatologists who have referred their patients for radiotherapy have been disappointed in the claims made for it and do not advocate its use. The best book of reference in the English language upon the use of these agents in the treatment of skin diseases is said to be McKee's. Hazen, another prominent dermatologist, says that x-rays are the most useful single agent the dermatologist has at his disposal today. MacKee's method of dosage calculation and administration is the best in use.

Dermatologic radiotherapy requires attention to details above all else and especially the details of dosage. The man attempting this form of therapy must be well grounded in both dermatology and radiology.

On the Skin Reactions to Radium and Their Avoidance in Therapy. An Experimental Investigation. J. C. MOTTRAM, Radium Institute, London. Brit. Jour. Radiol., 29: 174-180, May, 1924.

RATS were used in this investigation undertaken to discover the factors controlling the variations in skin reactions which are well known to occur in different individuals, and even in the same individual; also to determine if possible, whether burning of the skin in radium therapy could be avoided.

In his general conclusions and discussions of results the author says that exposure to cold in the neighborhood of 0° C. increases the skin reaction, whereas blanching the skin and stoppage of the blood flow, either with or without congestion, decreases the skin reaction. In view of the fact that exposure of the skin to water at this temperature causes it to become pink, it would seem that the above findings may all fall under the simple law that an increased blood flow causes an increased reaction and a diminished blood flow a decreased reaction.

Clinically, there is evidence that a flushed skin is especially sensitive to exposure. In hyperhidrosis the axilla and other moist surfaces are usually sensitive; especial care is required to prevent burning a skin rendered erythematous by inflammation, sun-burn or other causes.

Several attempts were made with different agents to promote an increased blood flow but no satisfactory way was found.

As to whether the promotion of an increased blood flow could be taken advantage of clinically to raise the sensitiveness of a tissue to radiation is regarded as doubtful. Fibrotic tumors are commonly less sensitive than are quickly growing tumors with their full blood supply and the spleen and bone marrow is especially sensitive, but it may be some other factor than blood supply that determines this.

The obvious hypothesis is that radiation causes some injurious substance to be produced in the blood.

External Cancers: Their Treatment at the Los Angeles Cancer Clinic. Chairman's Address, Section on Dermatology and Syphilology. A. DAVIDSON, M. D., California and Western Med. J., 22:324-325, July, 1924.

IN BASAL-CELL epitheliomas, radiation fails to cure in 10 to 15 per cent of cases. Other methods are more effectual.

In cancer of the mucous membranes, radiation is useless. Radiation has been largely employed in these cancers of the tongue and mucous membranes and although other operators have reported cures from x-ray and radium, this clinic has seen none. Surgical removal with the Percy cautery is preferred.

In breast carcinomas both preoperative and postoperative radiation has been tried and the preoperative is considered undesirable as it leads to a temporary paralysis of the vasomotor nerves which leads to a great ly increased loss of blood during operation, although if time were no object and the operation could be delayed three or four weeks, preoperative radiation might be of advantage, the writer thinks. Postoperative radiation he considers is of value

without doubt. He remarks that a certain type of individual seems nearly immune to carcinoma of the breast and skin and that it is the seborrhoeic and hairy individual who is most apt to be attacked; one seldom finds carcinoma of the uterus in a white-haired patient, which he considers interesting. Carcinoma of the breast is more common in the unmarried or in the woman who has never suckled children, while carcinoma of the uterus is more common in the woman who has borne children. Nonmalignant tumors of the breast are frequently associated with fibroid tumors of the uterus.

In radiation of sarcomas the treatment should be strictly limited to the growth itself and the adjacent surfaces should be carefully protected.

Radium in the Treatment of Nonmalignant Diseases. FREDERICK S. BURNS, M. D., Boston M. & S. Journal, 191:16-20, July 3, 1924.

RADIUM therapy of the skin demands two essential qualifications: first, the training of a dermatologist; second, special training in the technique of radium as applied to the skin.

Of benign tumors of the skin removable by radium the following are at present recognized as the most important: keloids, vascular and pigmented nevi, lymphangiomata, benign cystic epithelioma, synovial cysts and rhinoscleroma.

Radium has become valuable in the treatment of lupus erythematosus although the tendency to recurrence is common and the course of the disease is not checked. In psoriasis, lichen planus and chronic eczema radium has a limited field of usefulness. Superficial hypertrophies of the skin curable by radium are senile keratosis, verrucae, callosities and in some cases clavi.

X-Ray and Radium in the Nonmalignant Diseases of the Eye. GEORGE S. DERBY, M. D., Boston M. & S. J., 191:20-21, July 3, 1924.

THE writer bases this paper upon a thorough review of the literature of the past fifteen years upon this subject.

Later results do not bear out the earlier claims made. Particularly is this true of trachoma and cataract and Cohen reports that he has abandoned the use of radiation in cataract.

Radiation has proved itself useful in vernal conjunctivitis although the best method of application, optimal dose and number of exposures necessary, are points not yet entirely worked out.

Radium and x-ray are also useful in xanthelasma of the lids, also in the vascular tumors, nevi, angiomata, lymphangiomata, hemangiomata and cavernous angiomata.

X-Ray Treatment of Deafness: A Preliminary Survey. HAROLD L. WARWICK, M. D. Texas State J. Med. 20:194-198, July, 1924.

RICHARDSON'S technique and results are reviewed (see abstract, page 249, July Journal). The author gives a number of case reports of patients benefited by treatment.

Ordinarily the response following this treatment is not immediate but as the lymphadenoid hyperplasia becomes gradually reduced the eustachian tube accepts larger and larger bougies and proportionately to this effect the hearing improves.

The dryness of the throat complained of several days after exposure can be definitely traced to an inhibited cellular secretion and this same dessicating action is probably exerted upon the cells lining the eustachian tube. On the basis of this effect can be explained the apparently good results attained in the treatment of serious and catarrhal deafness.

Electrotherapy, Rest and Exercise in the Treatment of Cataract. SAMUEL J. HARRIS, M. D., Am. J. Electroth. & Radiol. 42:226-233, July, 1924.

MOST cases of incipient cataract can be cured, provided the case is sent to an oculist who is an expert in the therapeutic use of electricity and exercises and the patient is treated by the method described in this paper, which includes the use of the constant current, the sinusoidal, the x-ray flash, the high frequency current, white light and vibration to the spine, pneumomassage, complete relaxation of mind and body by palming, flashing and swinging. In treating eye conditions use of the opthalmoscope is imperative. Details of technique are given.

In cases of long standing there are no choroidal changes, the vision can be improved, the progress of the diseases stopped and sometimes cured. Some cases will improve immediately and some will remain stationary for a long time and then improve. Some improve for a month and then remain stationary. In all cases in which the disease is progressive as indicated by fat granules and nebulae, and when there are no complications of cirrhosis of kidneys or liver, diabetes, or organic disease of the heart or lungs, improvement may be expected.

Radium Clinic for Treatment of Eye, Ear, Nose and Throat Conditions. J. J. CORBETT, M. D., Boston M. & S. J. 190:1082-1084, June 19, 1924

THE Boston City Hospital, in August 1922, started a clinic for radium treatment of some eye, ear and throat conditions, but only two per cent of the cases treated were cancerous. The work is, of course, in its infancy in this clinic, but to show along what lines it is being done cases were shown at the last meeting of the American College of Surgeons.

Cases of hypertrophied tonsils of the large spongy kind have been successfully treated by radium. Enucleation is advised for diseased tonsils, but if operative treatment is contraindicated or if the patient positively refuses operation radium is second choice and may be used with considerable confidence.

Epitheliomata of the nose and hemangioma of the septum of the nose are the most interesting nasal cases treated.

Corneal scars and cataracts are the principal conditions upon which the eye work has been concentrated. Greatly improved vision has resulted.

Interpretation of Dental Radiographs. HUGH W. MACMILLAN, D. D. S., International Journal of Orthodontia Oral Surgery and Radiography. 10:375-379, June, 1924.

IN LONG standing chronic bone conditions the roentgen ray is infallible, but it is almost useless in any pathological dental condition which has not wrought enough destruction to show through the superimposed conditions.

One must remember that many parts of the teeth and surrounding bone cannot be shown by the roentgen ray, due to certain structural features and also that pulp vitality or nonvitality is not conclusively disclosed, neither are acute nor subacute inflammations of the teeth gums and peridental membrane recorded. The virulence of an infection is not determined radiographically, the size of the destroyed area has nothing to do with the virulence.

Interpretation depends upon the general resistance of the patient, the age of the patient, the history of the teeth, the general history, laboratory examinations and evidence peculiar to the individual under treatment.

The roentgen rays do not show the character of the root filling opera-

tion and it makes considerable difference whether the canal has been filled *a la Callahan* or by some embalming or devitalizing agent. Neither does the x-ray determine the character of the pulp and the putrid material under misfitting gold crowns; the negative report here is absolutely valueless.

The patient would be immeasurably benefited were dental radiographs interpreted in conjunction with clinical findings.

Has the Roentgen Ray a Dental Therapeutic Value? J. DONALD PEEBLES, D. D. S., Dental Cosmos, 76:762, July, 1924.

FROM observations made during the routine radiography of his practice the author has come to believe that roentgen rays possess a definite analgesic and therapeutic property which may have great possibilities in dentistry if a definite and suitable technique can be worked out. He has observed that many times after the radiography of a "sore tooth" the soreness has disappeared for a long period afterwards. He does not believe that all such occurrences as he has noted can be possibly due to chance, but that the use of the x-rays has in some way brought them about.

Dental Stereoroentgenography. C. A. LEMASTER. D. D. S., Dental Cosmos, 56:642-648, June, 1924.

PERSPECTIVE is a valuable aid in dental radiographs although it has not been made much use of, owing to the difficulties of technique in that particular field. The author, however, has invented a technique for dental stereoscopic films that he finds so simple as to be used routinely in his practice. This article gives the technique in detail in this issue of the Dental Cosmos. If a copy is desired it can perhaps be secured from the publishers at 211 So. 12th St., Philadelphia. Single issues are twenty-five cents.

A New Technique for Investigating Maxillary Sinuses by X-Rays. HERMAN BESSER, M. D., Med. J. & Rec., 119:X, July 2, 1924.

AN IDEAL representation of the maxillary sinuses excludes the superimposed bony structures from the picture. Lateral and anteroposterior views cannot give this. The author gives the following technique for making a clear picture free from these objections:

The patient lies on the back, the head tilted back at an angle of 25 degrees. The side to be x-rayed is placed on the plate, the tube is tilted to an angle of 60 degrees, the cone brought downwards as near the uppermost mandible as possible. This gives a direct line from the tube to the maxillary sinus with a minimum amount of soft tissue and with no superimposed bony structure. The maxillary sinus on the opposite side should always be radiographed with the same technique for comparative study.

The Therapeutic Value of X-Rays in the Various Forms of Infection. W. D. WITHERBEE M. D. Am. J. Electroth. & Radiol., 42:218-221, July, 1924.

THE author says it is evident that the adjacent lymph structures in the so-called cases of chronic pharyngitis and tonsillitis play an important role and that the tonsil and adenoid infection is only a part of the process.

The immunization produced in the tissues in the various forms of infection indicates that the x-ray fulfills the therapeutic requirements much better than any form of treatment directed solely to the tonsils and adenoids without subjecting the patient to any of the discomforts or complications attending other methods of procedure.

The evidence obtained from a review of the literature indicates that small doses of x-ray produce the most desired results.

The removal of tonsils and adenoids and the excision of the breast in carcinoma both leave the involved lymphatics in the adjacent tissues.

Fully 80 per cent of cases observed by the author from one to three years, suffering from recurrent attacks of tonsillitis and pharyngitis, have been relieved by x-ray therapy. The same results are obtained in cases of recurrent pharyngitis, in which the tonsils and adenoids have been removed. Many of these cases give a history of from one to three operations for the relief of this condition.

The Treatment of Hyperthyroidism by Roentgen Rays. G. E. PFAHLER, M. D.. Am. J. Electroth. & Radiol. 42:207-212, July, 1924.

THE report of Means and Holmes upon this subject is referred to as the most satisfactory one of recent date. An abstract of this appears in the July, 1923, Journal, page 253.

Technique: Patient supine, head thrown back, pillow under neck. The thyroid and thymus regions are divided in the median line; a horizontal line is drawn above the thyroid enlargement extending outward from the median line to each side; a second vertical line is then drawn downward and outward obliquely, beginning about two and one-half inches to the outer side of the median line. Treatment is then given through the two central fields, directing the rays downward and inward, thereby obtaining some crossfiring effect on the deeper portions of thymus and thyroid. The patient is then placed in the prone position and the face rotated toward the side being treated, and treatment given through the two posterior fields, directing the rays downward and inward to obtain the greatest amount of crossfiring with the least effect on the skin. These four treatments are usually given in one day and only in an exceptional case are they divided. About 78 to 80 per cent of an erythema dose is given through each of these areas using a filtration of 6 mm. Al and a distance of 25 cm. The erythema dose varies somewhat for the individual and the factors making up the dose vary considerably according to the installation, therefore each operator must learn the erythema dose value for his own installation.

The interval between the first and second course of treatment is usually four weeks. In urgent cases the treatment may be repeated within three weeks, but after this it should not be repeated for at least four weeks and as soon as symptoms indicate an approach to normal the interval should be gradually lengthened. usually to six weeks, then to eight weeks, but judgment must be used in this matter and the patients' symptoms and their habits kept under control. The author avoids giving more than eight or ten treatments as undesirable skin effects may result.

It is of first importance to eliminate any focus of infection, no stimulants should be allowed and physical and mental excitement should be avoided as far as is possible. General medical treatment should be employed. Cooperation of surgeon, internist and radiologist will bring about the best results. A basal metabolism test should be made at the outset to serve as a control for treatment.

Good results may be expected in about two-thirds of the cases and are about equal to the results from surgery. If patients do not show definite improvement within three or four months an operation should be advised. With proper technique,

two or three preliminary treatments will do no harm and will permit of safe operation.

Radiation Therapy of the Thyroid and Ductless Glands. GEORGE W. HOLMES, M. D., Boston M. & S. J. 191:10-12, July, 1924.

CLINICAL data lead to the conclusion that the ductless glands when they are hyperactive are especially sensitive to radiation.

The hyperactive thymus is very easily affected and the effective dose is far below that which would injure superficial structures. Establishing the diagnosis is the greatest difficulty. The amount of activity may not depend upon the size of the thymus. It must also be remembered that diagnostic plates must be taken at the same stage of respiration each time and that the thymus enlarges when the child cries. Benefit from treatment may occur within 24 hours or it may take a week. Two or three treatments may be necessary but they should never be prolonged nor more than two-thirds of an erytehma dose given. The chest may be exposed over the upper thorax in front using 0.28 E. U. and giving about one-half the erythema dose with a similar exposure over the back. Once the diagnosis is definitely established radiation therapy is justified.

The same therapy is a valuable adjunct to surgery in cases of hyperthyroidism, and in goiter cases only those showing hyperthyroidism should be irradiated. It should never be employed simply to reduce the thyroid tumor and probably surgery gives quicker and more permanent results although in most cases the patients remain well after radiation therapy.

Early cases with soft thyroid tissue react better to radiation than do long standing cases with hard glands, and patients with high metabolic rates show greater susceptibility than do those with low rates.

Cardiac complications and economic conditions must be taken into consideration in selecting cases for radiation.

Technique: Exposure over three areas, two over the thyroid, one over the thymus region, in such a manner that each lobe of the thyroid is exposed and the larynx avoided as much as possible. The wave length used is of medium length and the distance relatively short. Too long a distance or too short a wave length increases the dose to the deeper structures and is unnecessary. At present the author is using a 12 inch target skin distance and a wave length of 0.28 E. U. The amount given at each exposure should not exceed two-thirds of an erythema dose and should not be repeated within three weeks. The number of treatments in a given case should not exceed seven, and five or six are usually sufficient. The patient should be cautioned against applying ointments to the neck and against long exposure to the sun.

The Present Status of Roentgen Ray Therapy for Diseased Tonsils. O. M. ROTT, M. D., Northwest Med. 23:260-261, June, 1924.

THE writings of Nuzum, Lederer, Borden, Babcock and Shurley are referred to or quoted in opposition to use of the x-ray in tonsillar disease or infection.

The author says that he is very skeptical as to the value of the roentgen ray in tonsils and that while there are some cases in which delay of surgical intervention might be justified and roentgen therapy given a trial, yet in certain other cases delay is most dangerous.

X-Ray Treatment of Tonsillar and Associated Lymphoid Tissue. C. A. RUTHERFORD, M. D., Northwest Med. 23:258-259, June, 1924.

THE author has had the experience of working for several months with Dr. Witherbee and since that time has treated 100 cases in his own private practice with most favorable results.

He reviews the literature upon this subject, quotes prominent workers who find radiotherapy useful in the treatment of lymphoid tissue conditions and summarizes his experience and his findings thus: "The tonsils and adenoids are only a part of the diseased lymphoid tissue in the average infected throat. Small repeated doses of x-ray, 0.05 to 0.20 of a skin unit given at two week intervals will cause any degree of atrophy of lymphoid tissue without damaging other tissue. A biochemic change takes place which inhibits bacterial growth. X-ray will cause shrinkage, drainage, recovery of protective epithelium, and immunity."

The Use of Radium in the Treatment of Tonsils. FRANCIS H. WILLIAMS, M. D., Am. J. Med. Sci. 168:18-34, July, 1924.

DR. WILLIAMS sums up his three years' experiences with radium radiations in the treatment of tonsils thus: Radium is a valuable therapeutic agent not only for the treatment of faucial tonsils but also for other lymphoid tissue in the throat. The output of the radiations from radium is uniform in quantity and quality, therefore the dosage can be accurate; if the radiations used in a given case are adapted to the conditions present this remedy is an unusually safe one in careful hands.

"This method of treating the tonsils with radium, so far as can be determined by an experience of over three years, evidently has advantages for (1) cases that are not good operative risks; (2) those in which tonsillectomy is is incomplete. instead of a second operation; (3) for some cases in which the diagnosis is obscure.

"In how large a proportion of the cases, for which tonsillectomy is ordinarily advised, radium should be used, time and further experience will demonstrate.

"This method is also adapted to the treatment of lymphoid tissue in the pharynx and in the region near the Eustachian tube in cases of ear trouble.

"There need be no delay in the use of radium on account of the season of the year, or because of acute conditions in the tonsils themselves. or of an acute stage in diseases that have their source in the tonsils.

"There have been no harmful results from the use of this method in the more than 200 cases that I have treated, the first of them more than three years ago."

Dr. Williams has devised special instruments for use in this therapy. By means of these instruments the desired amount and quality of the radiations may be applied under good illumination. The gamma rays only may be used or a mixture of gamma and beta rays. The instruments are described and pictured and they consist of: A specially contrived gold container with an aluminum cover, diaphragms and filter; an electric lamp clamped to the container; an evacuator, a laryngeal mirror and tongue depressor especially adapted for these treatments.

The treatment may be so moderate as to produce no discomfort in the tonsils or so vigorous as to cause some irritation there for a few days. Conditions vary widely in different patients and only experience can determine the exact amount and quality of radiations to be applied. Details of his technique are given.

Case reports of cases treated are given and include reports of enlarged tonsils, tonsillitis, arthritis tonsillitis and arthritis, lingual tonsils and cases of previous tonsillectomy where results of the surgical treatment were not satisfactory be-

sides several miscellaneous cases such as frequent colds, sore throat, sensitive throats with pain in the ears, etc.

The Correction of Physical Conditions Which Lead to or Cause Functional Psychopathic or Neuropathic States. WILLIAM BENHAM SNOW, M. D., Am. J. Electroth. & Radiol. 42:212-218, July, 1924.

THE reflex phenomena associated with the algesic conditions may be attributed to reflex phenomena originating in the spinal center of the corresponding area with associated hyperesthesia at the periphery, and may be relieved by peripheral or central treatment or both.

The conditions of pelvic origin in the male and female may originate from inflammatory conditions in the viscera in this region with marked psychic phenomena, and in the earlier cases may be cured by a restoration of the parts to normal. The cause is undoubtedly associated with some impairment of the autonomic nervous system.

Auto-intoxication in various atonic conditions arising from various individual irregularities terminates in psychopathic states and is amenable to treatment by correction of the cause, by restoring the neuromuscular tone in the viscera, so relieving the reflexes of the atonomic nervous system.

To constipation are largely attributable the irregularities referred to in one part of this report, arising from a general poisoning of the system, with the consequent reflex phenomena, terminating in insanity. The psychoses thus caused may be corrected and cured in the early stages by the removal of constipation and the unloading of the colon.

Case reports are given in which hay fever, spasmodic asthma, exophthalmic goiter, and splanchnic neurasthenia were benefited by physiotherapy.

Roentgen Cardiac Studies in Children. C. WINFIELD PERKINS, M. D., Radiology, 2:367-373, June, 1924.

THE x-ray findings in pericarditis with effusion are thus summed up: (1) Heart, globular in shape and enlarged symmetrically, with widened base. (2) Heart shadow larger in the recumbent position than in the vertical position. (3) Diminished impulse of the heart under fluoroscopic examination. This is due to pressure of sack fluid. (4) Visulization of the silhouette of the heart within the pericardial sack swollen with fluid. (5) Obliteration of the costocardiac angle, due to fluid in the pericardial sack is an unreliable sign, the author thinks, as conditions of the pleurae and lungs involving that region simulate distension and enlargement of the right heart.

From the x-ray study of 350 cases of cardiac disease during the past three summers at the Seaside Hospital the author has arrived at the following conclusions as to the value of the x-ray examination in arriving at a diagnosis of cardiac diseases of children:

1. The roentgen examination in cardiac diseases of young children is of material aid in confirming physical signs.

2. It presents an accurate method of differentiating normal from abnormal hearts in children at different ages.

3. Progress of the disease may be noted by successive roentgen examinations.

4. At all ages in the normal there is a constant ratio between the transverse diameter of the heart and the transverse diameter of the chest.

5. As a method of differentiation between congenital heart disease and thymus gland disease it is invaluable.

6. Associated pathological conditions of the chest can be demonstrated.

7. Chronic cardiac disease is associated with pneumofibrosis, increased peribronchial shadows, fanlike in character, confined to the upper lobes of the lungs. This is verified in children as well as in the adult.

8. It offers valuable aid in differentiating cardiac enlargement from pericarditis with effusion.

9. Distortions in the shadow of the heart due to imperfect technique may stimulate c a r d i a c disease shadows.

10. Successive exposures in x-ray examination should be taken in the same position and at the same distance on the same respiratory impulse, and times of exposure should be identical.

The Value of X-Ray in the Diagnosis of Pulmonary Tuberculosis. J. W. LAWS. M. D., Southwest. Med. 8: 263-265, June, 1924.

THE x-ray is of great assistance in diagnosing pulmonary tuberculosis and in determining the extent of the disease and in locating the size and character of the cavities. It is a great aid in checking up on physical examinations and in making a diagnosis of non-tuberculous diseases of the lungs but the diagnosis of active tuberculosis should not be made from x-ray plates alone but in conjunction with physical signs, subjective symptoms, complete clinical and laboratory examinations.

After the diagnosis of tuberculosis has been made, serial plates or fluoroscopy at intervals will be of great assistance in the treatment by means of pneumothorax, will be of some assistance in prognosis and will be of value in conjunction with physical examination to give accurate information as to extension and progress of the disease.

Some Clinical Observations on Heliotherapy in Pulmonary Tuberculosis. BERNARD HUDSON, M. D., and LEONARD HILL, M. D., F. R. C. S., Lancet 206:1147, June 7, 1924.

WHILE the sun cure is generally admitted to be the best method of treating surgical tuberculosis it may be a lethal weapon in certain cases of pulmonary tuberculosis. To subject febrile cases to this method of treatment causes increased tissue destruction. The patient's powers are severely enough taxed to dispose of the products of tissue destruction already caused by the disease, and sun treatment only weakens such a patient. Applied wrongly and to the wrong case sun treatment can excite a smouldering disease into a flaming one.

The types of pulmonary tuberculosis suitable for sun bath are those where the disease is of the localized single focus type, also cases showing no fever and in which the activity of the disease has been arrested although the sputum may still show tubercle bacilli. Where disease is of the pleural type exposure to the sun often clears up the thickening and adhesions. The bronchial asthmatic type also does well.

Sun baths are contra-indicated in disease of the scattered type and where there is a liability to fever either periodically or continuously. Cases easily auto-inoculated or prone to hemoptysis should not have direct exposure given them but the ultraviolet rays from the sky and the cool open air are beneficial in such cases.

Dosage and application are as important as proper selection of cases. It is not a hot sun that is needed by these patients but a pleasantly warm sunlight and cool air in the open. Treatment should not be given in an inclosed space. The authors have found that in the Swiss Alps the winter sun at midday is plenty warm enough so that patients can be exposed wearing only a light bathing suit or a loin cloth. Their beds are

wheeled out onto the roof which is sometimes covered with snow and the light dry cool air combined with the pleasantly warm direct rays of the sun has been found very efficacious. The summer midday sun is too warm and at that season direct rays are employed only in the early morning.

Sun bathing should be begun slowly and increased regularly according to the patient's need. Head and neck should be covered and sun burning should be avoided. A slight erythema followed by tanning is what is required. Once pigmented the patient can stand a longer exposure, but if fatigue, sweating or a definite febrile reaction sets in the time of exposure must be cut down. The whole procedure should be a tentative one, carefully controlled and watched.

X-Ray Studies of Fuso-Spirochetal Infections of the Lungs. I. PILOT, M. D., Radiology, 2:424-429, June, 1924.

THE conclusions appended to this paper read: In preliminary lesions, particularly abscess, gangrene and bronchiestasis with the production of fine sputum the putrid character is usually the result of infection with fusiform bacilli and spirochetes; these organisms resemble in their morphology those found about normal teeth and tonsils and in Vincent's angina.

The diagnosis, course, and the influence of salvarsan on these lesions are most readily studied by the x-ray.

Solid infiltration of the lung, incorrectly called syphilitic because of clearance under salvarsan therapy, are usually fusiform spirochetal infections which respond to specific therapy.

Chronic Myelogenous Leukemia. G. R. MINOT, M. D., T. E. BUCKINGHAM, M. D., R. ISAACS, M. D., Jour. A. M. A. 82:1489-1495, May 10, 1924.

OF 166 patients with chronic myelogenous leukemia 78 treated by irradiation and 52 not so treated are known to be dead. The latter serve as a control group to the former.

Irradiation has had little effect on prolonging the life of these patients. The average duration of life after the first symptom of disease in 52 non-irradiated patients was 3.04 years; in 78 irradiated patients it was 3.5 years. Of these 130 patients, 42 per cent lived from two to four years and 12 per cent lived more than five years and up to ten years.

Continued, properly administered irradiation produces symptomatic benefit, which is often marked, and offers to the patient the best guarantee of the longest possible preservation of his working capacity but efficiency decreases as the disease progresses. All but five per cent of the 78 patients were benefited sufficiently by radium or roentgen ray treatment to remain able and useful for varying periods of time. At least 50 per cent became temporarily symptomatically well; only 6 per cent of the 52 not radiated had moderate remissions. On the average the duration of efficient life in the patients radiated was 30 per cent. The earlier the treatment is begun the greater the degree of efficiency and the longer the period of efficiency.

In estimating the probable duration of life one must take into account the clinical state, the blood, the metabolism and the irradiation.

Lymphatic Leukemia: Age Incidence, Duration, and Benefit Derived from Irradiation. GEORGE R. MINOT, M. D., and RAPHAEL ISAACS, M. D., Boston M. & S. J. 191:1-9, July 3, 1924.

DATA are given concerning 98 cases of chronic lymphatic leukemia and 57 cases of the acute form of the disease. End results have been studied especially in 80 cases of the chronic form over 30 years of age; 50 treated by intensive irradiation from radium or roentgen rays and 30 that were not.

Most cases of chronic leukemia occur from 45 to 55 years of age. Acute lymphatic leukemia seldom occurs after the age of 25 years. Both types of leukemia affect males about three times as often as females and both forms are more frequent in the earlier years of the female than in her later years.

The correct diagnosis of the chronic cases was not established on the average until 1.4 years after the the first symptoms, though on the average a physician was consulted about six months earlier. Acute cases were not recognized on the average until they had run about two-thirds of their course.

Irradiation had no detectable effect on prolonging the duration of either form of the disease. The average duration of life after the first symptom of 80 chronic cases, over thirty years of age, was 3.45 years, being essentially the same for the 50 irradiated and the 30 that were not.

About 60 per cent of all chronic cases lived one to four years and 14 per cent lived from six to eight years. About 50 per cent of acute cases died in less than two months after initial symptoms.

The early institution of radiation does not as yet promise a more favorable prognosis as to life extension but irradiation properly administered undoubtedly does benefit symptomatically cases of the chronic form, though not to the extent that occurs in chronic myelogenous leukemia. Moderate or greater general improvement occurred after the first course of irradiation in 47 per cent of 61 cases; rather slight improvement in 30 per cent and no improvement in 23 per cent. The efficiency of 10 per cent of patients was strikingly increased. The beneficial effects in acute lymphatic leukemia are evanescent and slight.

Irradiation may produce a better production of the three formed elements of the marrow and lessen the activity of the formation of lymphatic cells. The hemoglobin level, number of blood platelets and character of the lymphocytes serve more to adjudge the patient's condition than the number of white cells. An aleukemic picture may occur when patients are seriously ill. Radiation usually causes little or no improvement of the patient when the hemoglobin is 50 per cent or less, or when outstanding purpura with thrombopenia is present, or when there are many immature and atypical lymphocytes in the peripheral blood. The effect of irradiation on decreasing the size of the lymph nodes or spleen in chronic lymphatic leukemia is apt to be proportional to the amount of improvement in the patient's general sense of well being. Very definite exceptions occur but distinct pressure symptoms due to enlarged external or internal lymph nodes were very rarely not alleviated.

Treatment should be guided and prognosis made from correlated information obtained from the patient's history and physical signs together with complete blood examinations and basal metabolic rate determinations. By so doing in spite of the irradiation becoming less and less effective and the patient's comfort decreasing, this therapy is of distinct value and maintains the patient's efficiency usually much better than is done without irradiation.

Roentgenological Findings of the Upper Right Quadrant of the Abdomen. A. P. OVERGAARD M. D., F. A. C. R. Nebraska M. J. 9:264-269 July, 1924.

THIS paper classifies gastric ulcers and duodenal ulcers cancer of the stomach, direct and indirect find-

ings of gall-bladder pathology and discusses their roentgenographic diagnosis.

The Reaction of Abdominal Tumors to Radiation. ARTHUR. U. DESJARDINS. M. D.. Jour. A. M. A. 83: 109-113, July 12, 1924.

THE difference between tumors involving an abdominal organ or structure and tumors arising elsewhere in the body is a difference due to type and degree of specialization, and is a difference inherent in anatomic. chemical or other metabolic relationship including the distribution and supply of tissue fluids.

Different types of normal tissue cells are graded for sensitiveness to radiation as follows: (1) genital glands (2) blood, (3) spleen and lymphatic glands (4) mucous membranes skin. (5) liver, (6) kidney. (7) muscle, (8) bone, (9) nerve tissue.

Radiosensitiveness is probably influenced by other factors than the rate at which the mitotic cycle takes place and differences in blood supply and in the tendency to produce anaplastic products and bacterial infection probably have much to do with such variations. Progress in the treatment of tumors will be delayed until more is known of their nature and how roentgen rays and radium produce the changes observed.

Tumors derived from testicular epithelium are almost always extremely sensitive to radiation with a recession so striking that it is almost a means of differentiating between the connective and epitherial tissue tumors derived from the corresponding germinal elements of the testes.

The pathology, sensitivity of and reaction to irradiation is discussed for the lymphomas, leukemias, Hodgkin's disease, lymphosarcomas, myomas and sarcomas.

New York City Cancer Institute. ISAAC LEVIN. M. D.. Med. J. & Rec. 119:618, June 18, 1924.

THIS institute is organized on such broad lines that it can take care of all types of cancer patients and also can conduct every line of cancer research.

Its object is to diagnose and care for such of the poor of New York City as are suffering from cancer. The institute is a complete medical unit within the Department of Public Welfare and it is aided by all the hospitals working with that department. It is particularly affiliated with the hospital on Welfare Island and with the City Hospital. A medical director has charge and he has a staff of associates and assistants and all the members of the medical boards of the hospitals of the Department of Public Welfare are consultants to the Institute.

Patients are divided, roughly, into three classes. For each of these groups a separate building is used, partly because of the different problems presented by the three classes and partly to avoid the depressing effect of the more severe cases upon the others. Class A consists of those in an early stage of the disease who require only a few days of hospitalization. Class B patients are those who may require several weeks hospitalization and Class C are those for whom only palliation can be attained.

This centering of effort in cancer treatment is providing a better means of treatment for all patients and it also provides a better means of training the younger medical men in cancer therapy. and is helping to educate the public.

Treatment of Malignant Diseases with Radium and X-Ray. Cancer of the Cervix. ROBT. B. GREENOUGH. M. D.. F. A. C. S.. Surg. Gynec. Obst. 39:18-26. July. 1924.

THIS is the report of the *Committee on the Treatment of Malignant Diseases with Radium and X-Ray* which was appointed by the American College of Surgeons in February, 1922. That association recognizing the need for a critical review of the various methods for the treatment of malignancy appointed Drs. Greenough. Burnham, Crile. Duane. Finney, Lee, Pancoast, Wells, and Wood as a committee to investigate the matter.

The Committee selected carcinoma of the cervix for immediate study. Complete and uniform case records were secured of all such cases admitted to the wards of 22 clinics. The statistical results of this study have been subjected to the mathematical corrections used by statisticians in making allowances for the numerical variations due purely to chance. so they are more nearly accurate than are the average statistics presented in a medical paper.

The Committee plans to continue the collection of data and to extend the three year limit to five years or even longer and to publish supplementary reports including the details of operative treatment and technique of radiotherapy employed. Similar investigations are under way in cancer of the breast, mouth and tongue.

The mass of data collected in the study of the treatment of carcinoma of the cervix is reported in the original article. the summary of which reads as follows:

1. Of 829 cases of cancer of the cervix, 94 were free from disease three or more years after treatment. More than half of these "cures" were obtained by the use of radium and x-ray without radical operation. There were no "cures" by the cautery alone.

2. In 243 cases of early favorable and borderline cases, hysterectomy alone cured one in three, with an operative mortality of one in five. Radium with palliative operation (cautery) cured about one in three and radium alone or with palliative operation cured about one in five. Under these conditions it may be said that the choice between operation and radium in the treatment of early and favorable cases of carcinoma of the cervix is an open one. It is to be borne in mind that the results of treatment by radium used with the technique of the present day are not yet available, but that it is generally believed that they will be better than the figures here presented.

3. In more advanced cases the "cures" either by radiation or hysterectomy were very few.

4. The duration of life in the unsuccessful early cases is somewhat greater after radium than with operation.

5. The formation of rectovaginal and vesicovaginal fistulae occurred with nearly equal frequency with all methods of treatment.

6. Radium with or without x-ray or palliative operation was the most important agency in the destruction of local disease in cases which failed to obtain a "cure." The value of radium as a palliative measure in advanced cases is beyond dispute.

7. In the treatment of recurrent cases after hysterectomy and in cancer of the cervical stump radium is to be preferred to other methods.

8. A sufficiently large dosage of radium is necessary to obtain destruction of the local lesion. The treatment of cancer of the cervix with inadequate amounts of radium should not be encouraged. A uniform classification of the pathological varieties of cancer of the cervix is much to be desired.

X-Ray and Radium in the Treatment of Non-Malignant Diseases of the Uterus. LAWRIE B. MORRISON. Boston M. & S. J. 191:13-15, July 3, 1924.

THE recent literature on this subject is reviewed.

The author says that judging from his results in over 300 cases he feels that roentgenotherapy has a definite field together with surgery in this particular group of diseases.

In properly selected cases there is no mortality. Indications for treatment depend upon the well known factor of age, the nature of the fibroid and its size, and upon the factor of hemorrhage as a symptom. As to the nature of the fibroid, the interstitial form is most tractible. The multiple, pedunculated, subserous, submucous or adenomatous types are best treated by operation. Fibromata with hemorrhage react more quickly to radiation than do others. The discharge diminishes and completely disappears. Hemorrhage without fibroid is easily cured or relieved. Contraindications are calcified fibroid, or one undergoing degeneration, malignant myomata or infected myomata and complications such as suppurating salpingitis, pelvic peritonitis or ovarian cysts. Fibromata up to the size of a five months pregnancy are easily reduced. Large tumors, especially if pressure symptoms are present, should be treated by operation if possible.

Obstetric Roentgenography. W. A. NEWMAN DORLAND, M. D., F. A. C. S., Radiology 2:10-19, July, 1924.

THE application of roentgenography to embryology and obstetrics is still in its early infancy and deductions made today may have to be changed tomorrow.

The author believes that obstetricians and radiographers should be on guard against possible disastrous consequences which may follow the too frequent or unlimited use of the rays in early pregnancy.

After the seventh week of intrauterine life it is possible to affirm pregnancy and to approximate the age of the fetus because the various centers of bony ossification are vaguely apparent.

Roentgenoscopy of the pelvis before, during, and after gestation may yield valuable information bearing upon the possibilities of dystocia and its proper preventive treatment as well as upon the effects of labor upon pelvis articulations. The roentgenologist should obtain plates of every type of deformed pelvis that opportunity offers.

If the radiologist holds in mind the danger of x-rays in early pregnancy, namely ovular death and abortion and the inducing of abnormalities, he may use the rays to great advantage. They will differentiate between pregnancy and tumor and in advanced pregnancy the position in the uterus can be determined, also the relationship between the fetal head and the pelvic canal. Multiple pregnancy can also be determined. Towards the close of gestation spontaneous version may occur and the rays will reveal it. Determination of fetal outlines cannot be relied upon before the close of the fifth month of pregnancy.

Remarks on the Treatment of Fibroids of the Uterus. CUTHBERT LOCKYER, M. D., F. R. C. P., F. R. C. S., Brit. Med. J. 1:1037-1040, June 14, 1924.

THE author discusses this subject under myomectomy, subtotal hysterectomy, total hysterectomy, and radiotherapy.

Of radiotherapy he says that along with Frank (American) he believes that radiotherapy needs to be protected from its friends. "Granted that radiotherapy is of great value in the treatment of a prescribed number of uterine fibroids, we have to decide two questions: (1) What are its limitations, and (2) in what form is it best employed? In attempting an answer to the first consideration I should include: (1) Some of the 33 cases, in which I performed vaginal hysterectomy—that is, cases, in which the operative mortality was nil, the tumors relatively small, and uncomplicated by degeneration or diseased appendages; cases, that is, in which the symptomatology closely simulates the myopathic uterus (chronic metritis) by causing the postponement of the menopause, with severe bleeding after the age of 40. (2) Cases of uncomplicated fibroids requiring treatment, but in which considerations of the general health contraindicate operation—for example, cardiac and renal diseases, Grave's disease, diabetes, phthisis and other respiratory complications, and, finally, dread of an operation. (3) As an alternative to blood transfusion in cases of profound secondary anemia to render the patient fit to stand radical curative measures. Weiss records eight cases with a hemoglobin percentage below 35 which were treated by radium and in two of them the uterus was subsequently removed."

The author very much prefers radium to x-rays. He has found it useful in the treatment of hemorrhage in cases of chronic metritis and intends to extend its use to the treatment of hemorrhage in cases of small uncomplicated uterine fibroids at the time of the climateric.

The Relative Position of Surgery, Radium and X-Ray Therapy in Carcinoma of the Prostate and Bladder. ISAAC LEVIN, M. D., Urologic and Cutaneous Rev. 28:392-398, July, 1924.

THE possibility of malignancy in all cases of a hypertrophied prostate should be considered and operation should be done if possible in these cases. If microscopic examination proves the removed prostate to be malignant, radiotherapy should be resorted to immediately. Even in the earliest cases of carcinoma of the prostate, surgery alone cannot be considered sufficient. Well screened radium applicators should be placed in the rectum in order to influence the deep pelvic lymph nodes and high voltage x-ray therapy given to those parts of the skeleton where metastases from carcinoma of the prostate usually takes place, i. e., dorsal and lumbar spine, sacrum, pelvic bones and heads of the femur. Even discreet primary and metastatic tumors of the skeleton may be destroyed by radium and the x-rays and may be replaced by new bone formation with return of function and loss of pain, therefore, the chances are much better when the metastases in the bones are so small that they cannot be discovered either clinically or roentgenographically but are only suspected.

In late cases of carcinoma of the prostate no surgical removal should be attempted, but the method of choice is insertion of radium emanation into the prostate by screened radium emanation. Patients with carcinoma of the prostate learn to catheterize themselves, and only when catheterization is not possible should a suprapubic drainage be considered.

In carcinoma of the bladder, radium therapy and particularly insertion of radium emanation is the method of choice and must follow even a complete excision of the tumor. Excochleation or cauterization of the tumor prior to insertion of the radium is very essential. X-ray therapy is of little value in carcinoma of the bladder. Cystoscopic insertion of radium should be avoided.

Radium in the Treatment of Benign Hypertrophy of the Prostate. HERMON C. BUMPUS, M. D., J. Urol. 12:63-70, July, 1924.

AS A HEMOSTATIC in cases of benign bleeding prostates, ra-

dium produces excellent results. In cases of unexplained pain in the perineum and groin associated with prostatic enlargement, radium treatment has given marked relief. In cases of marked prostatic enlargement with considerable residual urine, radium treatment has been disappointing. In cases of slight prostatic enlargement with little or no residual urine, radium has relieved obstructive symptoms, and reduced the residual urine; thus it seems to act as a prophylactic against the progress of the disease.

Polyuria Caused by Recurrent Bladder Carcinoma: Report of a Case With a Study in the Effects of Pituitrin and of Deep X-Ray Treatment. E. A. FLETCHER and W. M. KEARNS. J. Urol. 12:37-47, July, 1924.

A BRIEF survey of the literature is first given and is followed by the authors' own observations, a detailed case report being submitted.

In this case the tumor and all symptoms disappeared for a period of five years upon treatment with fulguration and x-ray. The growth recurred then and after deep x-ray exposure there was inflammatory reaction and an occlusion in the ureter which was involved in carcinomatous infiltration, and acute hydronephrosis and uremia resulted. Pituitrin failed to influence polyuria, thirst and polydipsia, and the patient died. "The case serves to impress very vividly the danger of producing ureteral obstruction when deep roentgen therapy is applied to carcinoma involving one or both ureters. The preventive lies in close cooperation between the x-ray and urology departments and frequent cystoscopic examination for signs of obstruction."

Improvement in the Roentgen Ray Diagnosis of Gall-Bladder Disease. WILLIS F. MANGES. M. D., Therapeutic Gazette, 48:385-390, June, 1924.

A PATHOLOGICAL gall-bladder is not always shown in definite shadow; its outline may be irregular because of adhesions, or may be so far from normal position that it may be taken for an intestinal loop. If there are adhesions they will usually cause a deformity of the stomach, duodenum or colon to give a fairly definite clue.

A gall bladder that does not drain well, if it causes a pressure contact with stomach, duodenum or hepatic flexure of the colon will produce a depression taking the shape of that part of the gall-bladder in contact with the organ, while normally the peristaltic movements of stomach or intestines compress the gall-bladder.

Hyperistalsis of the stomach is considered by Carman as a corroborative sign, especially if of the multiple wave type. Hypermotility of the intestines the first six hours after the barium meal is also so considered, likewise irritability of the duodenum and reversed peristalsis of the duodenum. Undulating irregularity in the outline of the right diaphragm may indicate pathology in the upper right quadrant, although it is sometimes difficult to rule out adhesions or irregularities on the upper surface of the liver. These indirect signs should be weighed together with the history and clinical aspects of the case, then, if organic lesion of the stomach or duodenum or appendix is eliminated a probable diagnosis of gall-bladder pathology is justified.

Any indication for study of the gall-bladder calls for a study of all the abdominal organs and for a fluoroscopic study of the chest as well. Any indication for a gastro-intestinal examination calls for a definite effort to visualize the gall-bladder or to demonstrate the presence of stones. Symptoms definitely referable to the right kidney may be due to gall stones etc.

Gall stones are roentgenographically classified as follows:

1. A single dense stone casting a uniformly dense shadow. This calls for differentiation from a kidney stone.

2. Multiple fairly dense stones, which by their size, shape, position and arrangement warrant easy positive diagnosis, a common finding.

3. Collection of dense sand, giving quite a positive shadow. This is a rare finding.

4. Stones frequently single, which contain only thin surface deposits of material dense enough to cast positive shadows. The shadows may be extremely delicate and will be found only in films or plates of excellent quality and made with reasonably short exposures. This type of stone is fairly common, frequently is large, but at times only careful search will reveal them.

5. Stones, usually multiple, definitely less dense than surrounding structures and casting so-called negative shadows. These are in the "speculative group" and one should be extremely careful to eliminate small collections of gas in the duodenum or colon as the cause of the "negative shadows" before interpreting them as gall stones shadows. They are much more apt to be shown in gall-bladders that contain very dense material or in gall-bladders with dense walls so that in immediate surrounding structures there is a tissue or substance of considerably more density than the stones themselves.

6. Stones, usually multiple, which do not cast distinguishable shadows either positive or negative. Their presence should always be suspected when there is a definite crescentic shaped depression in the duodenal cap or some other portion of the gastrointestinal tract in the right upper quadrant.

The Mounting of X-Ray Intensifying Screens. A Handbook for Roentgenologists.

THIS is a little booklet published by the Patterson Screen Co., Towanda, Pa. It is free of cost and contains directions for technique that should be valuable to the roentgenologist. The headings are: Method of Mounting; Good Contact; Mounting the Screen in the Bottom of the Cassette and on the Lid of the Cassette; Care of Cassettes and Screens; Washing Screens; Removing Stains.

Mind and Medicine. THOMAS W. SALMON, M. D., Professor of Psychiatry, Columbia University, New York City, 1924. Small octavo, 33 pages. Paper. Columbia University Press, New York City. Humphrey Milford, Amen Corner, London.

THIS booklet contains an address given by the author at the opening session of the College of Physicians and Surgeons, Columbia University, New York City, Sept. 26, 1923.

Its theme is the need of a new attitude of medicine toward mind and it takes up the following topics: (1) Attitude of medicine toward insanity. (2) Attitude of medicine toward psychoneuroses. (3) Attitude of medicine toward other mental problems. (4) Origin of present attitude toward mind. (5) Waning interest in function. (6) Some new tendencies.

The formal attitude of medicine toward mind is not the individual attitude of many physicians among whom are great leaders of medical thought, and herein lies the promise for the change that is bound to come. The time is coming when "Fear, anxiety, compulsive ideas, emotional disorders and anomalies of conduct and feeling will be, in *fact* and not merely by *implication*, medical problems." Also the time is coming when as Dr. Ray Lyman Wilbur has said "the human mind, the human

will and human personality will be as important for the medical student as typhoid fever, small-pox and cholera." When that time comes it will come to pass that "Upon a foundation of knowledge of the mechanisms of mind and their relations as far as known, with the brain and other organs, will be built an adequate clinical training."

This book is the work of a scholar who can write simply.

A Descriptive Atlas of Radiographs of Bones and Joints. By A. P. BERTWISTLE, M. D., Ch. B, Resident Surgical Officer, General Infirmary, Leeds, England. Octavo, 198 pp. 299 illus. Cloth. Price $5.00. Published by William Wood & Co., 51 Fifth Ave., New York City. 1924.

THE purpose of this book is to provide a handy book of reference for students and practitioners to aid them in the interpretation of radiographs. The author has used the silhouette radiograph for all illustrations (see abstract Jour. Radiol. Feb., 1924, p. 67). This gives an appearance of reality to the x-ray photograph as it outlines the fleshy structures.

The first part of the atlas contains plates of the normal bones and epiphyses, a series of radiographs being used to show the appearances of the centers of ossification and the union of the epiphyses at various ages.

Fractures, diseases of bones, injuries and diseases of joints and miscellaneous conditions are each treated of in a separate section.

Most of the plates have been made from films taken in routine practice. Throughout the book the illustrations of normal bones appear on the left hand side of the page and the pathological appear on the right hand so that comparison is made more easily.

International Clinics. A Quarterly of Illustrated Lectures and Especially Prepared Original Articles. Vol. II. Thirty-Fourth Series, 1924. Octavo, 336 pp. and 80 illus. J. B. Lippencott Company, Washington Square Press, Philadelphia. London. Price, $2.50.

THIS well known work contains the following articles:

1. A New Physiotherapy Technique for Intranasal Diseases. Charles R. Brooks, M. D.

2. Mechanical Vibration in Cardiovascular Conditions. Mary L. H. Arnold Snow, M. D.

3. Influence of X-Rays and Allied Substances on Living Tissues. W. A. Norman Dorland, M. D., F. A. C. S.

4. Treatment with Radium. Sinclair Tousey, M. D.

5. Caudal Anesthesia in Neurology: A New Method for Locating the Sacral Hiatus. W. H. Haines, M. D., Nolie Mumey, M. D., and E. F. Faber, Medical Artist.

6. Diagnosis of Right-Sided Abnormal Conditions. Charles Gordon Heyd, M. D.

7. Syphilitic Aortitis with Special Reference to Treatment, Louis Potheau, M. D.

8. Symptomatology and Treatment of the Parkinson-Like Sequelae of Epidemic Encephalitis. Lewellys F. Barker, M. D.

9. The Nervous and Mental Aspects of Endocrine Dysfunction. E. Bosworth McCready, M. D., F. A. C. P.

10. Jaundice as a Symptom of Disease in Infants and Children. James Burnet, M. D., F. R. C. P. E.

11. Poliomyelitis. J. P. Crozer Griffith, M. D.

12. Recent Advances in Surgery, Donald C. Balfour, M. D., and Michael R. Flynn, M. D.

13. Certain Affections of the Shoulder and Their Management. Walter M. Brickner, M. D., F. A. C. S.

14. Ovarian Tumors in Childhood. James A. Cahill, Jr., M. D.

15. The Dangers of Taxis in Strangulated Hernia. Leigh F. Watson, M. D.

16. Clinic on Acute Appendicitis. I. S. Ravdin, M. D.

17. Intussusception. Ralph B. Bettman, M. D.

18. Management and Treatment of Brain Injuries. Thomas Meares Green, M. D., F. A. C. S.

19. A Clinical Lecture of Osteomyelitis. Astley P. C. Ashhurst, M. D.

20. Metastasis. O. H. Pepper, M. D.

21. Health and Hygiene in Industry. Thomas Darlington, Ph. B., C. E., M. D.